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The Physiotherapy Review

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Volume 25 **MAY-JUNE 1945** **Number 3**

The Role of Physical Therapy and Occupational Therapy in the Army Reconditioning Program

Donald L. Rose, Major, Medical Corps

In preface to the present discussion, it is realized that the announced subject cannot be adequately covered in the allotted time. In consequence, minimization of certain phases of either physical therapy or occupational therapy has nothing to do with the relative lack of importance of such phases but is purely an expedient whereby more discussion may be permitted of other phases of these closely related fields.

While it is true that the term "reconditioning" has been impressed on the popular mind during the present war, or more specifically within the past two years, as attested by numerous excellent recent articles on the subject[1], it is recognized that the principles of and the necessity for reconditioning of patients are not by-products of this war. Many of you no doubt are familiar with plans for reconditioning and rehabilitation stemming from experiences of World War I that are surprisingly similar to those now in operation. Despite the acknowledged soundness of these plans, during the times of peace they attained only local or transient fame. One reason for this is fairly obvious: in the peace-time practice of medicine the individual is the keystone of such practice, and all phases of such medical practice are subservient to a certain extent to the welfare of the individual patient; plans of the type referred to are not well adapted to single patients or small groups of individuals. In war-time or military medicine the individual becomes submerged in that over-all scheme or the organization of which he is a part. All gross phases of military medicine are keyed to the needs of the organization. Ultimately such phases devolve to the good health of the individual, but primarily in group fashion.

We may correctly ask ourselves what are the needs of the group or organization? All branches of the military service have lucidly summarized these needs in slogan fashion. The Medical Department of the U. S. Navy, for example, has the mission "to keep as many men at as many guns as many days as possible." Regardless of the arm or branch of service the aim of the Medical Department is common: to restore the patient to his organization in proper physical and mental condition as quickly as possible.

With the increase in patient load in military hospitals, the need became obvious for a type of reconditioning program adaptable to the handling of a large number of patients. It is beyond the scope of this discussion to present the many activities of the present form of the reconditioning program. However, in order to present physical therapy and occupational therapy in correct perspective, it is necessary to consider the primary aspects of reconditioning.

In brief, the reconditioning program concerns itself with four important elements: (1) physical reconditioning, (2) educational reconditioning, (3) occupational therapy, and (4) diversion or

Walter Reed General Hospital, Washington 12, D. C.
Read before the New York Chapter of the American Physiotherapy Association, January 17, 1945.

recreation. The purpose of such a program is the establishment in the individual soldier patient of that state of mental and physical toughness so essential to the proper performance of duty.

Obviously not all hospital patients are on the same physical, mental or morale levels. In recognition of this fact, the reconditioning program is keyed to the progress of the patient. All patients on admission to the hospital are classed as zero patients; they are not a part of the reconditioning program. Only when the medical officer classifies him is the patient approached by a representative of the reconditioning program. At this time the program is explained in some detail to the patient in order that he may know its purpose and his role in it. The type of exercises which he will be expected to perform and other general activities in which he will be expected to take part are furnished him in printed form and he is given the opportunity to familiarize himself with them before his part in the program actually begins. From this point on, the patient becomes a part of the program, unless prevented by illness, surgery or absence from the hospital. No soldier patient is otherwise excused from participation in the program. All exercises are standardized and must be approved by the Office of the Surgeon General. They are graded in type, character, extent, progression and duration in accordance with the individual's tolerance and classification. They are thus as adaptable to the patient who is confined to bed as to the patient who is almost ready for return to duty. A high degree of ingenuity is evident in the variation of exercises and adapted games to stimulate the competitive spirit within the patient groups as well as to combat the monotony which continuous repetition would otherwise engender. Discussion of this phase of the program could be prolonged indefinitely but without advantage for the purpose of the present topic. It is desired, however, to emphasize once again the aim of exercise, which is to improve progressively general muscle strength and tone. It also should be borne in mind that hospitalization for these patients is likely measured in terms of months, at the end of which time, barring a defect incompatible with military service, the patient returns to strenuous and physically exacting military duties.

Undoubtedly the majority of this audience is familiar with the classification of patients into four groups on the basis of their physical capacity. Class IV comprises those patients confined to bed all or most of the time. Class III includes those patients who are ambulatory and are capable of engaging in more arduous physical activity than the preceding group. Patients in these two groups are hospital patients in the strict sense of the word. By the time convalescence has progressed to the point that the patient can be "graduated" from Class III, a decision can reasonably be made as to whether he will be discharged from the service or can be returned to duty. If it appears likely that he can be returned to duty, the patient is then assigned to the advanced reconditioning section. This is administratively part of the hospital but is otherwise remote from it, both with respect to environment and management of the patient, and conforms to the plan advocated by Huddleston[2]. Here the patient is first classified as a Class II individual and, as his physical stamina increases, he becomes a Class I soldier ready for full duty.

The purpose of presentation of the foregoing classifications is not to serve as a description of the reconditioning plan but to point out that there is a definite line of cleavage in this program beyond which point neither physical therapy nor occupational therapy is applicable in the treatment of the patient. This dividing line is the "graduation" of the patient from Class III to Class II. This is a completely satisfactory line of demarcation, for, while it may occasionally interrupt the physical therapy management of the individual patient sooner than might be desired, it nevertheless preserves the same treatment for those who need it more and, at the same time, it promotes a spirit of self-reliance in the individual who is now in Class II, by serving notice on him that from that time on he is "on his own."

The same division line marks the limits of occupational therapy. In Classes IV and III, occupational therapy is employed to the limits of its important applications. Throughout the time the patient spends in these two classifications he is encouraged to take advantage of the benefits accruing from occupational therapy, from the time he is a bed patient to his "graduation" from Class III.

In considering the phases of reconditioning, one may wonder if this program encroaches upon or overlaps the fields of physical therapy and occupational therapy. This question, in the main, can be answered in the negative. The types of reconditioning exercises given are directed toward improvement of the individual's physical status in general. Therapeutic measures to correct or improve the specific conditions early in their management still are the responsibilities of the sister fields of physical therapy and occupational therapy. All conditions wherein

these methods of treatment are specifically indicated are referred to these departments for necessary treatment. This does not mean that boundaries can be drawn which rigidly divide physical therapy from occupational therapy or from reconditioning in general or any combination of these fields. Consideration of this question brings the speaker to the principal thesis of this discussion. Overlapping among these fields, duplication of effort, gaps in the treatment program, injured personal feelings and professional pride contribute to inefficiency in the program. These and all other such factors can be definitely minimized or eliminated entirely if the responsible officers of each of these fields meet on the common ground of the welfare of the patient and modify their contributions, if necessary, in the light of practicality. Such a procedure is not necessary in the individual case, of course, but it is necessary for certain conditions and groups of patients.

It is worth emphasizing that the desirable thing is not always the practical thing. This is clearly exemplified in the exercise program for amputation cases. The fundamental importance of the selective development of certain muscles and muscle groups related to the injured extremity is accepted without question. It would be highly desirable to be able to afford the time and skilled personnel to administer and supervise such therapeutic exercises on an individual basis. Important though these cases be, however, they constitute but one type of patient, and the same personnel must be made available to all who need physical therapy. In consequence, it has been necessary to develop an exercise program wherein the efforts of the reconditioning division and the physical therapy department are combined. After mutual agreement on the types of exercises to be employed, such exercises are then conducted on the ward or area other than the physical therapy clinic, by representatives of the reconditioning division with a physical therapist checking each patient for the correct performance of each exercise. Those patients who exhibit defects which cannot be corrected by this ward or mass exercise program are sent to the physical therapy clinic for the individual attention they need. In this fashion, the energies of the physical therapist are not diverted to and lost in activities that can be successfully accomplished by other personnel. Further, the number of patients that can be treated by such a procedure is considerably greater than is the case when strict individualization of treatment is attempted.

The same principle of the conservation of time and personnel is employed whenever possible. The remaining cases for which physical therapy is prescribed must be selected carefully in order not to include two classes of patients: those who would recover as rapidly without as with physical therapy and those in the treatment of whom physical therapy is not indicated. The treatment administered must be practical and devoid of procedures which, although impressive to the patient, are of no definite therapeutic value otherwise. Finally, with few exceptions, treatment must not be prolonged beyond certain practical limits. To do otherwise is to court disrespect for our specialty with but meager dividends in the form of higher incidence of patient recovery.

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Physical therapists are needed for poliomyelitis epidemic areas this summer. Write now to the National Office, 1790 Broadway, New York 19, N. Y., if you can serve.

Sitting and Sleeping Habits of Children

Mabel L. Fitzhugh

The effect of a child's habitual position on the shape of his joint surfaces and bony alignment is a fascinating study to one interested in body mechanics. It would seem that the person entrusted with correction of deviations would learn much from watching the patient for a typical 24-hour period to find out "how he got that way."

According to Wolff's Law, bones conform to the intensity and direction of the stresses and pressures to which they are habitually subjected.

Questioning the child or his mother as to suspected habits is usually unsatisfactory. The mother may look at her child a thousand times a day, but rarely can she tell exactly how he sits, lies or stands, at home and at play.

Take the case of Jimmie, age ten, who had pain in his feet and legs. The peroneal tubercle of each calcaneus was covered with large callouses on top of both feet. He had pigeon toes, flat feet, knock knees, unusually wide hips, round shoulders and drooping head. When asked if he ever sat on his feet on the floor the answer from both mother and son was "No, never." Yet, when he was observed at home during one afternoon, there he sat with his wide buttocks resting on the soles of his feet, playing with electric trains and an elaborate system of tracks. The mysterious callouses were caused by pressure and friction as he slid over the floor on them. Neither mother or son realized it until it was pointed out to them. Then the mother said, "He must have sat that way most of his playtime since he was five, when he was given his first train, and I never realized it." He was a city child, never allowed to play with other boys, with no chance to run and climb and develop a normal body. He was an extreme example of the effects of a habit on the growth processes. But it took a visit to his home and time to let him "be natural" to find out the underlying cause of his condition. It would have been impossible to help him if his habits had not been changed.

Another case was 13-year-old May, a well-built girl with scoliosis, right dorsal, left lumbar. "Do you like to read?" "Yes, lots." "Where do you sit?" "Oh, on the chesterfield." Observation at home found her curled in the corner of the chesterfield, both feet turned out at her right side, left elbow and book resting on the arm of the couch. It was her favorite place, since the light was good and she was comfortable in her customary position. A change to the other end of the couch was uncomfortable at first but effected a marked improvement in a few months, coupled with symmetrical exercises. Then she was taught to read sitting in a chair which fitted her, her feet flat on the floor, her back supported with no pressure against her hips and the book propped up on the table, properly lighted.

Jean, 18, showing a long left curve, was an habitual bookworm, too. She enjoyed reading lying on her left side, propped on her left elbow.

Francesca, 12, had a left dorsal, right lumbar scoliosis. She had carried her baby brother on her left hip and also had a habit of sitting on her right foot.

Laura, 19, has recurrent dislocation of both patellae. She tells of sitting on the floor for hours in her childhood, playing jacks, with knees acutely flexed, externally rotated, and her feet out at right angles to her buttocks. This position stretched the ligaments and capsule on the medial side of the knee joint, also the insertion of the vastus medialis, and contracted the lateral structures of the knee. X-rays show the distortion of the joint surfaces. She lives in fear of any imbalance or slight accidental slip which is all that is necessary to throw the patella out to the lateral border of her knee. The natural stability of her knees was destroyed. One may suspect that habits of early childhood might be the underlying cause of the well-known "trick knee" which gives trouble on the athletic field.

A five-year-old was seen with a distorted chest, a deep groove on the left side toward the front. His right foot was inverted, and his back showed a right C curve. Investigation found him sitting on the sole of his right foot, turned in under his buttocks, his left wrist pressed tight between his

San Jose State College, San Jose, California.

left knee and his chest, while he bent over a picture book lying on the floor.

Of course a few minutes a day in these positions would not cause these distortions in an active child, but many minutes every day spent by a quiet, bookish child, living in an apartment with little opportunity for active play will change the bony framework, the length of ligaments and the tonus of opposing muscle groups.

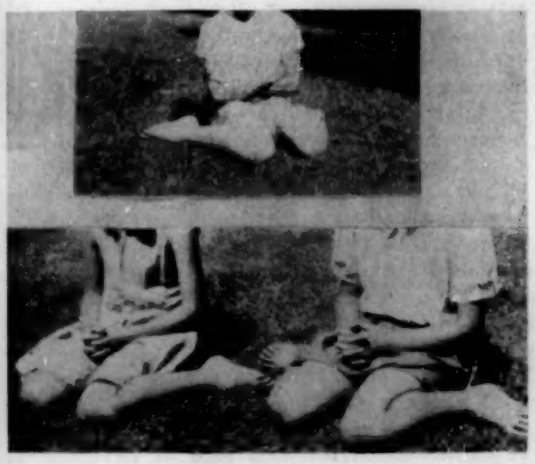

Fig. 1. Poor positions of infants.

Even an active child will show changes due to a one-sided habit in a few weeks. Four-year-old Jimmie was brought in by a worried mother because he was "getting crooked." He had been seen three months before and was in good condition then. What had happened? A new tricycle which he had not yet learned to ride but spent hours pushing around with his right foot on the ground, left foot on the rear axle, and his hands on the handle-bars had caused the trouble.

Then there was poor little Bobbie, only two, whose chest looked as if the narrow tire of an old Model T had run over it, the groove was so deep. Here was a problem. Children who sit with round backs usually have grooves but this was too deep for that. A long visit at his home finally ended with mealtime and the mystery was solved. He had kicked the foot-rest off his highchair so his mother pushed the sliding tray tight against his chest to keep him from sliding down and out or standing up, thus clamping him against the back of the chair. She said he just wouldn't eat so she always kept him in his chair for two hours every mealtime, trying to get some food down. Oddly enough she was furious when the effect of this practice was pointed out to her. This was a unique case as most mothers are only too glad to learn a better way.

Sitting in an adult chair with feet dangling seems to be responsible for refusing to eat in certain children. It is interesting to note the improvement in appetite and consequent gain in weight when furniture that fits the child is provided, especially when climbing is added for daily exercise. For comfort and correct posture in sitting, the chair must be low enough for the feet to rest flat on the floor or footstool with no pressure under the knees by the edge of the chair. A backrest or cushion to support the middle of the back, with nothing against the hips to cause sliding forward, makes the child comfortable and erect without effort. The top of the table should be a bit higher than his bent elbow when the child is sitting properly. If the table is lower than this he will droop over to rest his elbows on it.

It is desirable to establish a habit of turning over during sleep in the interests of a uniform development of children's bodies. Sleeping habits are the hardest to change and require the most attention and persistence on the part of the parent. Just after the child is sound asleep it is possible to turn him without waking if the old habit is not too strong. Sleeping on the stomach is the hardest habit to break; even at two months of age it has been found impossible to break in certain infants without a battle which the average parent is not capable of waging.

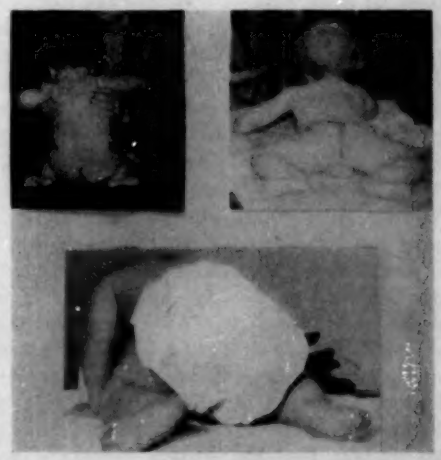

Fig. 2. Poor sitting habits of young children.

The bad effects of sleeping on the stomach habitually are evident in many babies and on into adult life. It has been noted that the college girls with marked lordosis are all stomach sleep-

ers. Other conditions associated with this habit are one-sided faces, inverted feet, pronated feet with prominent scaphoids, bow legs, crooked toes, bunion joints and shortened Achilles tendons.

If, from birth, an infant is placed on alternat-

Fig. 3. Distortion of knees from poor sitting habits.

ing sides for sleeping and on back and stomach for waking hours the prenatal curves of back and legs straighten out in a few weeks in the majority of cases. It is necessary to spread the hands wide apart when placing the baby on his stomach for play in order to overcome the round shoulders which may accompany the side sleeping position. These children learn to turn themselves during sleep of their own accord and sleep in all positions with equal ease. Their perfect bodies are proof of the value of this early care.

The drooping posture of chronic fatigue is perhaps the hardest of all habits to break. The child seems to be caught in a vicious cycle. He droops because he is tired and yet he is more tired because he droops. These children frequently are growing too fast for their muscular strength. If their friends are all shorter, a psychological factor is involved, so a program of correctives sometimes brings little result. One makes certain that the formal exercises do not increase fatigue. Afternoon naps may be necessary in order to break the fatigue habit. If swimming can be added to the program, the back stroke seems to give the quickest returns, alternating with floating for short rest periods.

The joy of working with little children is found in the rapid changes for the better which can be effected when symmetrical activities and corrected positions are substituted for the old habits. Nature seems only to need a good chance and the bent twig may soon be a straight, strong one—given proper nutrition and rest in conjunction with correction.

If supervision of habitual positions is desirable for the normal child, how much more necessary it is for the handicapped, especially those who must spend many weeks in bed. Long convalescence with the body in poor alignment not only may delay recovery but often fixes a deformity, especially in cases of infantile paralysis.

Mothers and nurses are being well trained in the care of the acute stage of anterior poliomyelitis but much still needs to be learned concerning the tedious months of convalescence.

The practice of allowing the child to sit up in bed or on the side with feet dangling should be discouraged as it is impossible for the child to sit erect thus for more than a few minutes. If the feet are supported by a chair or stool, sitting erect on the side of the bed for a short time is good training for the trunk muscles, but for longer periods it is better to take the child out of bed and place him immediately in a chair, with his feet on a footstool and his back supported by a firm pillow, keeping his body straight at all times. At the first sign of deviation he

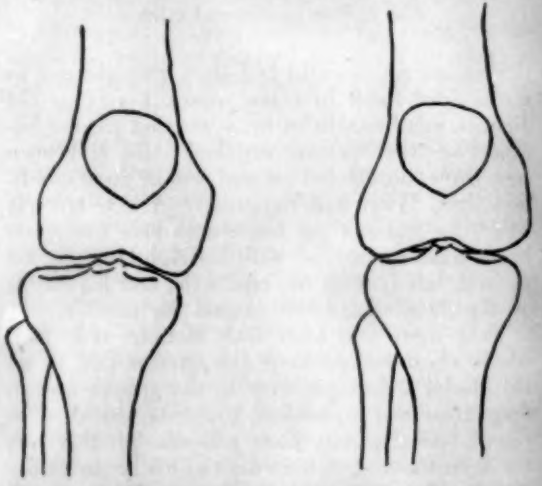

Fig. 4. Tracings from x-rays. (A) Distortion—probably caused by sitting habits during childhood. (B) Normal knee.

should be put back flat in bed. Short periods of sitting in correct position develop balance in the trunk muscles as well as confidence and pride in his erect posture which will hold over into later life.

It is important to change the position of the bed in the room or ward at least once a week.

Take the case of Bertie, age ten, whose involvement was mostly in his legs. His bed was in the corner of the ward, so in order to see what was going on he lay with his back to the wall, on his right side, propped on his right elbow, for most of his waking time for eleven weeks. When he sat up in bed both legs were turned out to the left, since his back was already bent toward the right. Changing the position of his bed every week from the beginning might have prevented this condition.

The habit of sitting on one or both feet is particularly dangerous when carried on through convalescence since it may increase weakness in the anterior tibial or foot muscles, allow the Achilles tendon to contract, tilt the pelvis and throw the spine out of line. These conditions are not likely to be noticed when the child is clothed and may not be evident until the damage is done.

After having had poliomyelitis many children spend much of their waking time reading, writing and even eating lying on their stomachs propped on their elbows. The bad effects of this habit are evident in the hunched position of the shoulders, increased lordosis even up into the dorsal region, and in a weakened abdominal wall.

It is exceedingly difficult to break any of these habits after they have become fixed during long convalescence, but it is easy to establish correct alignment by supplying the proper furniture at the beginning of convalescence and by training the child to use his own head to keep his body straight. A mirror strategically placed is a wonderful help. Expenses invested at the start may prove to be very small compared to those involved in a lifetime of effort toward correcting what might have been prevented at the beginning.

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Cerebral Palsy and Reflex Action

Grizzelle M. Norfleet, M.A.

What is cerebral palsy? The term "cerebral" denotes that the source of trouble is located above the spinal cord. "Palsy" denotes some disturbance of motion. In this paper we shall discuss what control the cerebrum has in reflex action, and interpret some symptoms of irregular motor manifestation of the reflexes with the accompanying physical mechanism.

Reflex activity starts in the prenatal period. Results of studies indicate that the human fetus starts to respond to external stimulation at the second month of prenatal development. The areas sensitive to external stimulation at this age are the mouth and nose. While the earliest responses observed homolaterally and usually contralaterally also are in the musculature of the neck, trunk, and then proceed to the limb-girdles, the reaction is exhibited in a stereotyped fashion and is fully integrated. This reaction of the fetus is only recognizable as the result of some external stimulation.[1]

This indicates that there is not only reflex activity in prenatal life, but there is a normal, progressive evolution of behavior in the human fetus. The sequent development of the earliest movements spread caudally to become more marked in regions of the lower trunk. Then discrete reflexes appear, accompanying the spread of skin areas sensitive to stimulation. By fourteen weeks, or earlier in some cases, the fetus has largely ceased to exhibit the more feneralized stereotyped responses, and its behavior is based upon an infinite variety and combination of responses. By twenty-five weeks, the essential reflexes for postnatal life, which were not present in fourteen weeks of prenatal life, are now ready and functioning. The maturation of the various specific reflexes has been appearing progressively, though they are still incomplete. This development continues long after the event of birth.[2]

Meigs[3] tells us that maldevelopment in the prenatal stage starts within the first two months of life. Therefore, congenital cerebral palsy can start at this early stage of development. However, a diagnosis has been made only at birth or soon afterwards, or through postmorten examination in miscarriages and stillbirth. Arena and Norfleet[4] state the following symptoms of congenital cerebral palsy: "Temperature regulation is very unstable (Case 2). In congenital defectives, fever often develops without any apparent cause. This happens only rarely in cases due to birth injury. There is little resistance to infection—these children are very sensitive to drugs, especially atropine." Many of these children die in babyhood. True etiology can be revealed only through postmortem examination.

Ford[5] states that the cerebrums of congenital cerebral palsy patients fall into three principal groups:

a. Those which show evidence of a diffuse degenerative process or atrophic lobar sclerosis ("lobar" referring to certain parts of the brain, and "sclerosis" meaning the wasting of connective tissue).
b. Those which show gross malformation of varying nature.
c. Those which are normal in appearance but show defects of development on microscopic examination.

Studies by Fleming and Roberts[6] show that less than 15 per cent of the infants with definite signs of cerebral palsy from birth injury live. Phelps[7] has calculated that there is an annual increment of seven cerebral palsy children in a general population of 100,000, but we do not know just what proportion of conditions started before birth or at the time of birth.

Early signs of the true birth-injury type are very important to identify, as educational measures can be started at once to compensate for the difficulty. As to the physical symptoms of birth injury, the traumatic damage is done and we do not, as a usual thing, have as many complicating difficulties arise as in congenital cases.

In birth-injury cerebral palsy, the cause frequently is intracranial hemorrhage, and the child is likely to be stillborn. If the child is born alive he is apt to be deeply asphyxiated. In most cases

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the physical signs of intracranial hemorrhage appear within a day or so after birth, but they may be delayed until after the first week of life. The most common clinical picture is one of recurrent cyanosis (blueness of skin) (Case 5). Respiration is disturbed and periods where respiration ceases may occur (Case 9). The child cries feebly or not at all. In most cases the child is rigid, especially on one side. The head is usually retracted and the hands clenched. An apathetic or stuporous condition exists. Local twitching of muscles occur commonly and may persist for hours, in irregular form.

The physiologists should be able to diagnose cerebral palsy through a study of reflex action. Out of mass activity in the newborn infant, which generally involves the entire body of the child, there are specific responses or unlearned[8] activity which started in prenatal life. The outstanding reflexes as summarized by Hurlock[9] as being present at birth, or shortly after, are: "pupillary, corneal, conjunctival, lip, tongue, chin, breathing, Darwinian (grasping), a child's tendon, patellar, abdominal, cremasteric, plantar, triceps, biceps, sucking visceral, flexion, knee jerks, pharyngeal, heart action, sneezing, Babinski (spreading of the toes) and others." For our purpose we can group some of these reflexes together and describe their diverse manifestations as symptoms of cerebral palsy, while others are insignificant in our diagnosis.

Through a study of the eye,[10] the cerebral palsy condition can be seen, especially in the birth injury type which we have already stated usually is due to intracranial hemorrhages. The eye balls bulge, or rather, there are changes in the eye grounds, which make pupillary, corneal, and conjunctival reflexes appear irregular with the bulging of the fontanels due to pressure. The eye motion which develops from these primary reflexes becomes very irregular, and as the child grows older we usually find nystagmus (rolling of the eyeball from side to side) and strabismus. Of course these conditions clear up sometimes, when there is nervous tissue uninjured to compensate for the lack of development and control, or educational adjustment. When there is tightness of specific eye muscles, we sometimes resort to surgery and follow this by the use of glasses and eye exercises to develop normal reflex action.

The lip, tongue, and chin reflexes can be examined with the sucking reflex. Jersild[11] discusses sucking as a response ready for use at birth, although this movement becomes a more specific response as the child grows older. When the child fails to take the mother's breast at birth, this is a true sign that something has happened to the upper chain of neurones. It may be cerebral palsy due to birth injury, or some congenital malformation as described under congenital cerebral palsy. Whatever the cause, it means a speech defect in later life. The use of a medicine dropper in feeding will sometimes stimulate the reflex of tongue, chin and lip into action; this in turn starts the sucking reflexes, and thus forms a ground work for speech articulation through the use of the nipple.

Breathing, heart action and pharyngeal reflexes which do not develop normally interrupt voice production. Very often we find perfect articulation, but in cases where the patient has difficulty with breathing, heart action, and pharyngeal reflexes, his speech develops in a rhythm which is labored and very hard to follow. The histories of such cases show no feeding difficulties mechanically, and the intellectual processes usually are very clear. The speech centers in the brain are theoretically located near the concept areas for all motor patterns. (This is, however, in dispute among those in the field of neuroanatomy).

Knee jerks, ankle jerks, Babinskis, abdominals, biceps, triceps, patellar, and such reflexes, show a hyper-reflex action if we have what is known as a spastic cerebral palsy case. The difficulty may be only in the speech organs, or one arm or leg, or in both extremities or in the trunk muscles but the point to be made is that if the reflexes are hyperactive, with a few exceptions, the pyramidal system is involved. These cases are much more likely to show general retardation as this system is directly under the control of the cerebrum. The more distressing motor defects may occur with the above named reflexes normal, but the trouble is in the end brain, or basal ganglion, which works in conjunction with the cerebrum. Tilney[12] holds that there is no direct connection between the basal ganglion and the pyramidal system. These cases of cerebral palsy come under athetosis or ataxia, which is due to lack of control in the center of coordination. These conditions too can be centered either in an arm, leg, two legs, or in the speech mechanism only, but they are more than apt to involve muscles of the entire body as the trouble is below the cerebrum.

The achilles tendon reflex is usually very hyperactive with the spastic type. This can be relieved through surgery and retraining of reflex action.

Due to tightness or flaccidity we do not usually

Labor	Early Symptoms	Diagnosis	Etiology
Case 1. 13 hours, head presentation, low forceps.	Deficient animation, difficulty in swallowing, exaggerated reflexes of right extremities.	Right hemiplegia	Probable birth injury
Case 2. 7 months pregnancy, breech presentation. Laceration of the sacrococcygeal area which healed.	First seen at 15 months. Muscular tension, restlessness, general rigidity. Some exaggerated reflexes, with overflow present in the legs. Irregular temperature.	Spastic paraplegia. Fair prognosis	Congenital
Case 3. Foot presentation. Mother had convulsions a few hours before and after delivery.	Sluggishness, restlessness, with rigidity. Muscular twitchings at 6 months. Difficulty in nursing. Marked paralysis in arms, neck, and tongue.	Severe athetosis in arms and neck. Fair prognosis	Birth injury
Case 4. 15 hours.	Period of stiffness at 3 months. At 5 months slow in physical development. Hyperactive in all reflexes. Developed respiratory infection.	Spastic quadriplegia	Congenital
Case 5. 7 months pregnancy. 2 hours labor.	Weakness, cyanosis, rigidity, difficulty in swallowing at birth. Convulsion at 4 years. General tendency to diseases. Reflexes of lower torso hyperactive.	Congenital, spastic diplegia. Fair prognosis	Congenital
Case 6. 36 hours labor, instruments used.	Deficient animation, difficulty in swallowing.	Tension tremor	Unknown
Case 7. 18 hours, head presentation, baby hurt about face and neck with forceps.	Could not swallow, artificial respiration for 20 minutes, did not cry for 3 weeks. Local paralysis in face. Convulsions soon after birth, 15 minutes apart for 24 hours.	Mild athetosis. Good prognosis	Birth injury
Case 8. 8 hours. No instruments used. 8 months pregnancy.	Convulsions about once a month at age of 2. Right side rigid, general paralysis on left side.	Tension tremor, mental retardation	Questionable
Case 9. 8½ months pregnancy, 20 hours labor, head presentation.	Artificial respiration and oxygen tent used. Restlessness, difficulty in swallowing, reflexes normal, poor coordination. Tight heel cords.	Primary incoordination	Anoxemia

find the cremasteric or plantar reflexes within the spastic child or individual manifested in the usual manner. Of course, in all these the grasping reflexes are usually overactive. The spastic tightness is due to lack of control from the pyramidal system to the muscles of flexion and extension which work symmetrically when the reflexes are normal, but in ataxia or athetosis there is tightness due to voluntary efforts to overcome the uncontrolled impulses from the base of the brain. Flaccidity is caused by continuous active stimulus going to one group of muscles and their antagonistic group receiving from the pyramidal system a far less degree of stimulus.

The amount of difficulty depends upon the extent and location of the brain defect. Should it be restricted to a single brain area primarily concerned, the child may suffer no greater mental consequence than does the child with a hemiplegia. Unless there has been severe injury to the brain or gross malformation to cause idiocy, the child with cerebral palsy may be considered as an individual who has little or no control over his reflexes, which do not develop in the usual manner.

At birth the baby's nervous system is unable to function properly, to select impulses from among the sensory impressions which bombard the nervous system and to translate them into purposeful action. Until this selective capacity develops with growth, babies grimace, drool, and wiggle quite unconsciously. They are unable to focus attention on any one object and will pick up a toy to reject it for another the following moment. Motions are without purpose. As intelligence develops, concentration on a purpose is achieved, aimless movements and reactions cease. Thinking actually develops the structure of the brain; therefore, education is the therapeutic treatment for cerebral palsy.

It may be postulated that as education builds up, the substance which insulates the nerve fibers increases. This insulating material is at a minimum at birth when there is a minimum of muscle control. It increases noticably at the time when walking and speaking start. It shows marked additions in adolescence as more connections are made between nerve fibers to facilitate the ability to classify the knowledge to which there has been exposure in childhood. Before this insulation is built up, the nervous system is like a switchboard with crossed wires, and impulses often bring wrong muscles into action. In the damaged area of a child with cerebral palsy,

normal anatomical development may not occur[13]. This insulation material is a soft, white, somewhat fatty substance which is medullated about the nerve fibers, forming a thick sheath. This conception of the "insulation" of nerve fibers at the present time is theoretical.

The process of formation in nerve physiology is known as myelinization; but in psychology it is what takes place during the process of maturation, controlled through the glands; it includes response to environment and general laws of growth and learning. Thus patterns of reflex action are formed which become more and more complex as myelinization or maturation takes place, and more under the control of the cerebrum. The importance of applying educational processes to rectify this type of defect cannot be overemphasized.

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EDITOR'S NOTE: Miss Grizzelle M. Norfleet, herself a victim of cerebral palsy, first attended Salem College at Winston-Salem, N. C., as a day student coming in her pony cart for the basic training. She received her B.A. degree from Salem in 1920, then attended Columbia University where she received her B.S. and M.A. degrees. She expects to receive her Ph.D. degree in the near future.

Six years ago Miss Norfleet endowed a Dormitory for Spastic Children in Durham, N. C., to be operated by the Orthopedic Department of the Duke University Hospital. This building houses twelve or more children who undergo treatment and hospital care in a home which is especially equipped for sufferers from cerebral palsy. The entire project is under the supervision of Miss Norfleet with the medical-technical supervision carried by the leading specialists from the Cerebral Palsy Clinic, Orthopedic Division of the Department of Surgery, Duke University School of Medicine. The Dormitory, formerly a residence, has been reshaped as a home for its particular occupants. The children are not thought of as sick people, hospitalized, but as twelve children with injured bodies who are learning to become as nearly independent as possible—thanks to the devoted care of Miss Norfleet.

Beginning of Orthopedics as a Specialty

The beginning of orthopedics as a specialty and the establishment of the first orthopedic hospitals can be traced back to the interest of the eighteenth century French humanitarians in crippled and deformed children. Jacques Mathieu Delpech, professor of surgery at Montpellier, was the real founder of the specialty. In 1828 Delpech published a treatise entitled Orthomorphy, which is the earliest comprehensive discussion of bone and joint deformities. He also planned and built a charming orthopedic hospital in the country between Montpellier and Toulouse. A contemporary of his, Johann Georg von Heine, an instrument and brace maker to the faculty of the University of Würzburg, founded an orthopedic institute in that city in 1816 which had a leading role in the development of the specialty in Germany. Heine's nephew Bernard Heine graduated in medicine from Würzburg and became its first professor of orthopedics in 1838. In England the first orthopedic hospital was founded at Birmingham in 1817. William John Little, an eminent orthopedic surgeon who himself had a clubfoot, founded the Orthopedic Institute of London in 1837. Subsequently called the Royal Orthopedic Hospital, it became the leading British institution for the care of the crippled poor. In America two pioneer orthopedic surgeons both established special orthopedic clinics in the same year, 1861. Lewis A. Sayre of New York organized a clinic at Bellevue Hospital, and Buckminster Brown of Boston opened a small private hospital, the Samaritan Hospital.—*From "A Hundred Years of Medicine" by C. D. Haagensen and Wyndham E. B. Lloyd.*

Physical Therapy in Aftercare of Amputations of Lower Extremity

Signe Brunnstrom, Lieutenant, WH (S) U.S.N.R.

At a recent meeting of allied surgeons in Toronto, Canada (February 1944), four "sites of election" were agreed upon as producing satisfactory stumps:

1. *Syme's*—a transmalleolar amputation. To cover the amputation surface, a posterior skin flap which includes the fatty subcutaneous tissue of the heel is utilized. This gives a good end-bearing stump.

2. *Midleg*—an amputation through the middle third of the leg about six inches below the knee. In all midleg amputations the fibula is retained although it is cut shorter than the tibia. Longer stumps are to be avoided, since such stumps usually have poor circulation, are sensitive, and are hard to fit with a prosthesis. Shorter stumps, through the upper third of the leg, are unsatisfactory because they do not provide sufficient leverage for knee action.

3. *Stokes-Gritti*—the femoral condyles are removed and the patella is fused to the end of the femur. It gives a good weight-bearing surface.

4. *Midthigh*—the ideal site is at the junction of the middle and lower third of the femur, although a true midthigh amputation is also quite satisfactory. Amputations through the upper third of the femur do not give as good results. In midthigh amputations skin flaps (but no muscular tissue) are used to cover the end of the stump.[1]

Physical Therapy Modalities

Heat in some form is often used to improve circulation of the stump and to relieve pain. For circulatory effects contrast baths are particularly recommended. The contrast bath by producing an alternate vasodilatation and vasoconstriction has a more beneficial effect on the circulation than has the hot or warm bath. As a rule long periods of water treatment should be avoided, since they tend to soften the skin. (The skin should be toughened rather than softened.)

Pressure exercises are given for the purpose of toughening the stump in preparation for weight-bearing. The patient is instructed to push the end of the stump against a firm surface with increasing force. At first only a light tapping can be tolerated. Gradually the stump can take a great amount of pressure.

Massage as a routine procedure should not be employed, since it may cause a traumatic neuritis in the sensitive nerves of the stump. However in selected cases it may be used as an aid in reducing edema and for loosening of scar tissue. To employ massage for the purpose of reducing the size of the stump would be a waste of time. It has never been proven that massage reduces fatty tissue. Shrinking of the stump gradually occurs because of atrophy of muscles not in use. It is furthered by firm bandaging.

Most important for the amputee is the exercise program which, in the following pages, will be dealt with in more detail. It is in planning this program and in supervising its execution that the physical therapist can be of great value.

Exercise Program

To obtain a well functioning stump it is necessary for the patient to go through all motions of the remaining joints as soon as his condition permits. The motions have a fourfold purpose:

1. To improve circulation and thus nutrition to the stump.
2. To maintain flexible joints.
3. To promote muscular tone and to increase muscular strength.
4. To develop coordination.

The first duty of the physical therapist postoperatively is to ascertain that the stump is maintained in the best possible position so as to prevent contractures. One must be particularly on guard against *knee flexion, hip flexion* and *hip abduction* contractures. Such contractures are frequently seen in amputees whose bed posture has not been carefully supervised.

1. Disapproved: Disarticulation of hip; disarticulation of knee; any amputation through the tarsal bones, leaving only the calcaneus and the astragalus, which invariably causes equinus position of the stump.

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Acknowledgment: The drawings are the work of Lt. J. W. Phillips, W-V (S) (H), U. S. N. R.

Fig. 1. A cuff around the stump is attached to a weight over a pulley in such a manner as to resist knee extension.

Fig. 2. (a) Pelvic obliquity caused by traction on stump. (b) With correction of the pelvis the abduction contracture becomes obvious.

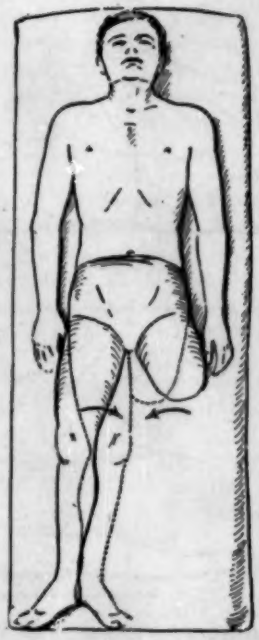

Fig. 3. Adduction and internal rotation of the thighs with pelvis "squared."

Knee flexion contracture most commonly occurs in midleg amputations. The natural reaction to injury or pain is the withdrawal from the injuring agent and the pain. This constitutes the "protective reflex of flexion." This reflex may, at least partially, be responsible for the appearance of flexion contractures. The stump is sensitive, and to protect it the patient, consciously or reflexively, pulls it closer toward him. The flexed position is most comfortably maintained in the side-lying position. It is not uncommon to see midleg amputees lying on the affected side, keeping both hip and knee in flexion. Even with a skin traction of several pounds the position does not become corrected, unless the patient at the some time is given definite instructions in regard to position. For the comfort of the patient, during the first few days after amputation, a small pillow may be allowed under the knee, but it should be removed as soon as possible. The patient remains in the back-lying position, or turns over to the prone position, but is not allowed to stay on his side for any length of time. Active knee motions are encouraged at an early stage, the motion of extension being emphasized at all times.

The quadriceps femoris is systematically trained by lengthening the daily exercise periods and by increasing the amount of resistance given. Quadriceps "setting" is practiced frequently, but it should be remembered that active joint motion is far more effective for strengthening of this muscle. Since, in amputation cases, the quadriceps no longer has to work against the weight of the foot and the leg, simple knee extension against gravity is not sufficient, but resistance must be applied. Such resistance may be given manually or by means of weights and pulley (Fig. 1).

Should a flexion contracture already be present, assistive stretching of the contracture may be given, provided the patient is able actively to assist the motion. In many cases, however, the knee flexors are hypersensitive to stretching and immediately respond by contracting, when an attempt is made to elongate them (increased stretch reflex). In such cases it is wise not to attempt any manual forced stretching of the flexors, but to emphasize active resistive quadriceps contraction. In calling upon the quadriceps to contract, an attempt is made to make use of the pattern of "reciprocal innervation" to ob-

Fig. 4. Assistive hip extension for flexion contracture of hip. Unaffected thigh is flexed to prevent motion of pelvis and lumbar spine.

Fig. 5. Side-lying active hip extension. Opposite hip is flexed to prevent motion of lumbar spine.

Fig. 6. Prone-lying hip extension. Care is taken not to abduct thigh while extending it. Raising the opposite arm prevents twisting the body.

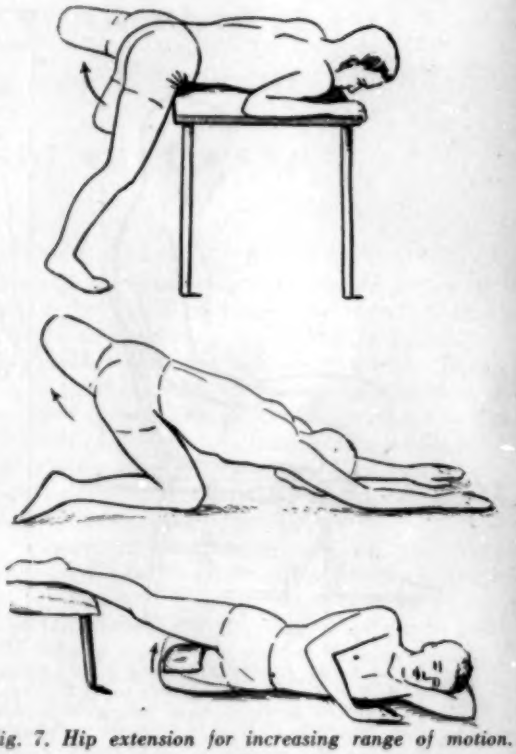

Fig. 7. Hip extension for increasing range of motion.

Fig. 8. Hip extension combined with spine straightening. Change to prone lying and push up again.

Fig. 9. Adduction of stump against resistance of weight.

tain hamstring elongation. It is not unusual to see tight hamstrings, even spastic ones, gradually getting soft during active resistive knee extension. In the presence of hamstring spasm, only a small amount of extension is attempted, the range being increased very gradually. Best results are obtained if during such training the hip joint is extended, or nearly so. Since the hamstrings originate above the hip joint, hip flexion would put these muscles on a stretch from above, and, with the added pull from below, when knee extension is performed, a reflex contraction is likely to occur. Knee extension in combination with hip flexion would not be attempted until considerable progress in hamstring relaxation had been made.

In stubborn cases of knee flexion contractures, when spasm is present, and when in addition changes in ligaments and capsule may have occurred, a cast may have to be applied or traction resorted to. To be effective, traction must be of long duration. "Lengthening reaction" may occur after the muscle has been pulled upon steadily for five minutes, but it may take as long as thirty minutes or more to bring about, depending upon the severity of the spasm. Traction

Fig. 10. Resistive extension of stump.

Fig. 11. Resistive adduction of stump.

is particularly effective during sleep when muscle spasm is diminished or absent and when muscle tone is decreased.

In below-knee amputations, while the attention is centered on quadriceps training, all muscles around the hip joint, back and abdominal muscles are also exercised, and the principles of good posture are explained. Since the unaffected leg in many respects has to do double duty, care must be taken not to strain it. Prolonged standing is discouraged, particularly if the arch is weak. If the shoe seems ill fitting, a special shoe may be indicated, and a consultation with the ward medical officer is arranged.

Hip flexion contracture is often seen in amputations above the knee, rarely in below-knee amputations. Supporting the stump on a pillow may make the patient more comfortable, but it is not a desirable posture since it maintains the stump in a flexed position. The same faulty position exists when the patient sits up in bed. To prevent a hip flexion contracture from developing the stump should be kept flat on the bed. Several times each day the amputee should turn over to the prone position, thus securing full extension at the hip. Prolonged sitting is discouraged. Gluteal contraction and active hip extension in the prone-lying position are begun as early as possible.

The development of a hip flexion contracture may be due to direct muscular imbalance as well as to faulty bed posture. In a thigh amputation the balance between hip flexors and hip extensors has been disturbed. The pectineus and the iliopsoas, two strong hip flexors, are intact. On the extensor side, the hamstrings and the adductor magnus have been severed. Unless and until the severed muscles gain a new insertion on the stump, hip extension will be weak and unbalanced. The gluteus maximus, without the aid of the hamstrings and the adductor magnus, will tend to rotate externally and to abduct the thigh as it extends it. Special hip exercises, as outlined in Figures 3 to 13, will help to restore muscle balance.

Hip abduction contracture, like hip flexion contracture, must be guarded against in above-knee amputations. Its appearance may be explained both on the basis of faulty bed posture and on the basis of muscle imbalance. When skin traction is applied to the stump without pelvic fixation, the pelvis will tend to tilt toward the side of the traction. Thus in a left thigh amputation the left side of the pelvis will be lowered. With the traction directed straight downward toward the foot of the bed, the thigh is in a straight line with the body, but because of the pelvic obliquity the position of the left thigh is one of abduction in relation to the pelvis, while the right thigh is adducted (Fig. 2a). Maintaining this asymmetrical position for some time may result in a more or less permanent abduction contracture of the stump. Should the traction, erroneously, be applied in an oblique direction, the condition is greatly aggravated. In the presence of an abduction contracture, after traction has been discontinued and the obliquity of the pelvis has been corrected, the abducted position of the stump becomes very obvious (Fig. 2b).

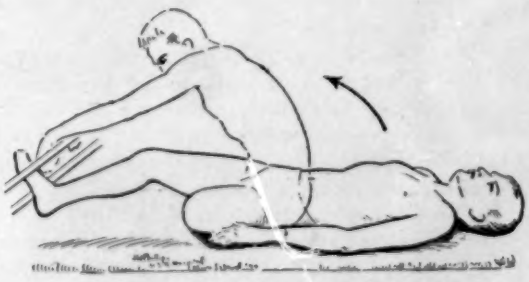

Fig. 12. For general flexibility and strengthening.

Fig. 13. Trunk-twisting with body inclined backward for strengthening of the abdominal muscles.

The abductor-adductor imbalance resulting from a thigh amputation is caused by the severance of the adductor muscles. The abductor muscles, on the other hand, inserting into the greater trochanter, are intact, and tend to pull the stump into an abducted position. The thigh offers little or no resistance to abduction, since the weight of the extremity is greatly reduced. Walking on crutches without weight-bearing on the stump

does not improve the condition; in fact, it aggravates the pelvic obliquity and with it the abduction contracture.

Walking with a prosthesis will be very awkward and inefficient if there is a flexion or abduction contracture, or both. In the former case the pelvis cannot be well balanced on the femoral heads but will be tilted forward, causing a lumbar lordosis. In the latter case the artificial leg will seem too long and will remain abducted, making proper weight-bearing impossible. A combination of the two constitutes a real handicap. Instead of utilizing a free pendulum motion at the hip joint, the amputee will get into a habit of swinging his artificial leg sideways, keeping the knee extended. When the body weight is transferred to the artificial leg, since the hip joint cannot be fully extended, the pelvis remains tilted forward. The trunk compensates by deviating posteriorly in an attempt to bring the center of gravity of the suprapelvic structures in line with

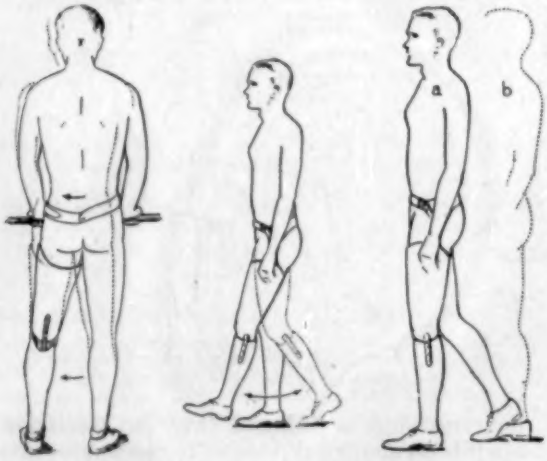

Fig. 14. (Left) Learning to transfer weight to prosthesis.

Fig. 15. (Center) Learning knee action and pendulum motion at hip.

Fig. 16. (Right) (a) Transferring weight forward on affected leg. (b) Rocking backward to starting position.

the weight-bearing femoral head. Frequently at the same time both arms are swung backward which further disrupts the natural rhythm of walking. Not only does this state of affairs make the gait very unsightly and slow, but it causes undue strain in the sacro-iliac and lumbar regions, often accompanied by pain, and it overstretches the abdominal muscles.

To prevent contractures and to develop muscular strength and coordination the bed posture of the amputee is checked at regular intervals, and he is put through a series of daily exercises designed to restore muscle balance around the hip joint. The exercises are first carried out by each patient individually under close supervision, at which time the purpose of each exercise is explained carefully. Group exercises are begun as soon as practicable. By having several amputees practicing together the element of competition enters in and the exercise period can be made more interesting and stimulating.

Some of the nonweight-bearing exercises used for thigh amputations are illustrated in Figures 3 to 13.

The sooner the patient can be fitted with a pylon the better. Weight-bearing on the affected leg brings all the muscles around the hip joint into play and strength and coordination are developed. A long period of crutch walking should be avoided also from the standpoint of posture, since it often leads to faulty postural habits. Pelvic side tilting tends to be aggravated. It is not unusual to see the amputee standing "hanging" on his crutches, his back curved and his head forward.

If the nonweight-bearing exercise program has been carried out assiduously, the amputee has very little difficulty in learning the coordination necessary for walking with a prosthesis. A few simple weight-bearing exercises are illustrated in Figures 14-16. These are followed by supervised walking on crutches, in a "walker" or with two canes, later without canes. Any swinging sideways of the affected leg is immediately stopped. It is to be insisted upon that the motion be strictly forward-backward, and that no circling sideways be allowed. Knee action is a "must" from the beginning. The steps should always be of equal length. Remember that it is better to do a small amount of correct walking than to walk a long distance incorrectly. Faulty habits are easily acquired but they are hard to break.

SUMMARY

1. Importance of correct bed posture immediately following amputation is stressed.

2. Knee flexion, hip flexion and hip abduction contractures must be guarded against.

3. Straight alinement of pelvis and thighs is obtained by "squaring" the pelvis, by avoiding the use of a pillow under the stump, and by encouraging the prone position.

4. Active nonweight-bearing exercises are begun at an early stage. All parts of the body are exercised. The motions of knee extension, hip adduction and hip extension are particularly emphasized.

5. When attempting to overcome contractures, manual stretching of tight muscles is avoided. Instead the pattern of "reciprocal innervation" is made use of to secure relaxation.

6. True contractures, involving capsule and ligaments, are overcome by the application of plaster or by continuous traction.

7. The early use of a pylon is recommended.

Schools for Physical Therapy Technicians

The House of Delegates of the American Medical Association in 1934 requested that some plan be effected for the establishment of standards, ratings and inspections of schools for the training of physical therapy technicians. The Council on Medical Education and Hospitals assumed responsibility for this program and by 1936 had completed a survey of these schools. Certain minimum standards were formulated. These were presented to the House of Delegates of the American Medical Association and were ratified in May 1936. The first published list of 13 approved schools for physical therapy technicians appeared in THE JOURNAL in August 1936.

It has been four years since the emergency course was outlined in an effort to supply larger numbers of physical therapy technicians to the Army. In that period there has been a progressive increase in the number of schools, the number of students, the size of graduating classes and, especially among the emergency programs, in the courses offered without tuition. Today there are 32 schools presenting approved training in physical therapy and offering a total of 41 courses. The latter are designed to attract not only those prospective students who desire the minimum amount of training but those who request additional training in physical therapy or the collegiate subjects which are integrated with the professional course. Soon it will be advisable to encourage an additional type of training designed to give selected students graduate instruction in the basic sciences.

Graduates last year reached a peak of 288 from the regular and 344 from the emergency courses. This total of 632 graduates will be exceeded by the estimated 904 graduates for 1945. Last year's estimate of the size of the present class was only 87 in excess of the actual number. Consequently it would appear that at least 800 graduates could be expected. Considerably more students could be trained by the present schools, since the maximum capacity of all schools has been placed at 1,229. Under present conditions it does not seem likely that this maximum capacity will be filled. Last year the total applications for enrollment in the regular courses was practically equal to the capacity, but many of the applicants are not qualified for the intensive curriculum which has been outlined. It is impracticable to correlate applications and capacity in the emergency courses, since half of these programs are located in army hospitals and all of the emergency students are expected to finish their practical supervised experience in army installations.

Entrance requirements are almost identical with those reported last year. All but 4 of the civilian schools admit students who have had two years of college training, including satisfactory courses in biology and other sciences. Two of the other schools require three years of college and a third is designed only for high school graduates who plan to devote four academic years to the curriculum, while the fourth limits enrollment to graduate nurses or physical education majors.

College credit is obtained in 1 emergency and 13 regular courses. Seven of the regular programs are designed for one full year of college credit during the nine to twelve months curriculum, while four additional programs provide enough college credit for a degree in the course outlined for high school graduates.

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Schools Approved for Training Physical Therapists

By Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requirements*	EMERGENCY COURSE				REGULAR COURSE			
				Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
Children's Hospital, Los Angeles	Samuel S. Mathews	Lily H. Graham	a-b-c	6	FebAug	$200	Certificate	12	FebAug	$200	Diploma
College of Medical Evangelists, Los Angeles[1]	F. B. Moor	A. H. Carlson	c	..	.....	....	.....	12	JanJuly	$215	Cert. or Degree
University of California Hospital, San Francisco[1]	Frances Baker	Margery Wagner	a-b	..	.....	....	.....	12	MarOct	$150	Certificate
Stanford University, Stanford University, Calif.[1]	Wm. Northway	Lucille Daniels	a-b-d[2]	7	Quart.	$286	Certificate	10	Quart.	$409	Cert. or Degree
Fitzsimons General Hospital, Denver	Ora L. Huddleston	Harriet S. Lee	†	6	Quart.	None	Certificate	..	.....	.....	.....
Walter Reed General Hospital, Washington, D. C.	D. L. Rose	Evelyn MacDonald	†	6	Quart.	None	Certificate	..	.....	.....	.....
Lawson General Hospital, Atlanta, Ga.	Arthur M. Pruce	Felie W. Clark	†	6	Quart.	None	Certificate	..	.....	.....	.....
Northwestern University Medical School, Chicago	John S. Coulter	Gertrude Beard	a-b-d	..	.....	....	.....	12	JulyOct	$300	Certificate
State University of Iowa Medical School, Iowa City	W. D. Paul	Olive C. Farr	b-c	6	MarSept	None	Certificate	9	MarSept	None	Certificate
University of Kansas School of Medicine, Kansas City, Kans.	Gordon M. Martin	Ruth G. Monteith	c[3]	..	.....	....	.....	9	Varies	$25[4]	Cert. or Degree
Bouve-Boston School of Physical Education, Boston	Arthur L. Watkins	Constance K. Greene	c[3]	6	July	$250	Certificate	36	Sept	$400 yr.	Degree
Harvard Medical School, Boston	Frank R. Ober	Janet B. Merrill	a-b-c	6	Varies	$250	Certificate	9	Varies	$300	Certificate
Boston University, College of Physical Education for Women, Sargent College, Cambridge, Mass.	Louis Howard	Adelaide McGarrett	H.S.	Given in conjunction with Harvard				36	Oct	Varies	Degree
Percy Jones General Hospital, Battle Creek, Mich.	Robert F. Dow	Margaret L. Rhodes	†	6	JanJuly	None	Certificate	..	.....	.....	.....
University of Minnesota, Minneapolis[1]	Miland E. Knapp	Sara E. Kollman	a-b-c	..	.....	....	.....	12	Jan	$200	Certificate
Mayo Clinic, Rochester, Minn.[1]	Frank H. Krusen	Carl O. Moe	a-b-c	6	JanJuly	None	Certificate	12	JanJuly	None	Certificate
Barnes Hospital, St. Louis	F. H. Ewerhardt	Beatrice F. Schulz	a-b-c	..	.....	....	.....	9	Oct	$200	Certificate
St. Louis University School of Nursing, St. Louis[1]	Alexander J. Kotkis	Sr. Mary Imelda	a-b-c[3]	..	.....	....	.....	9	Sept	$250 yr.	Cert. or Degree
O'Reilly General Hospital, Springfield, Mo.	G. S. Phalen	Ethel M. Theilman	†	6	Quart.	None	Certificate	..	.....	....	.....

Name and Location of School	Medical Director	Technical Director	Entrance Requirements*	EMERGENCY COURSE				REGULAR COURSE			
				Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
O'Reilly General Hospital, Springfield, Mo.	G. S. Phalen	Ethel M. Theilman	†	6	Quart.	None	Certificate	..	.....	....	.....
Columbia University, New York City	Wm. B. Snow	Josephine Rathbone	a-b-c	..	.....	....	.....	10	FebSept	$480	Certificate
Hospital for Special Surgery, New York City[1]	K. G. Hansson	Ethel Wilmer	a-b-c	..	.....	....	.....	9	Sept	$300	Diploma
New York University School of Education, New York City[1]	George G. Deaver	Paula Blackman	a-b-c	..	.....	....	.....	9	FebSept	$450	Cert. or Degree
Duke University School of Medicine, Durham, N. C.	Lenox Baker	Helen Kaiser	a-b-c	..	.....	....	.....	12	Oct	$200	Certificate
Cleveland Clinic Foundation Hospital, Cleveland	W. J. Zeiter	Anna Wetterhuus	a-b-c	..	.....	....	.....	9	Sept	None	Certificate
D. T. Watson School of Physical Therapy, Leetsdale, Pa.[1]	Jessie Wright	Kathryn Kelley	a-b-c	6	Oct	$200	Diploma	12	Oct	$200	Diploma
Graduate Hospital of the University of Pennsylvania, Philadelphia, Pa.[1]	Wm. T. Johnson	Samuel Henshaw	a-b-c	..	.....	....	.....	12	JanSept	$200	Certificate
University of Texas School of Medicine, Galveston	Robert L. Noell	Elsie Kuraner	a-b-c	..	.....	....	.....	9	Jan	$100	Certificate
Brooke General Hospital, San Antonio, Tex.	G. W. N. Eggers	Ruby Decker	†	6	Quart.	None	Certificate	..	.....	.....	.....
Bushnell General Hospital, Brigham City, Utah	Harry A. Bradley	Doris Anderson	†	6	JanJuly	None	Certificate	..	.....	.....	.....
Richmond Professional Institute, Richmond, Va.	Thomas Wheeldon	Erna Cannon	a-b-d	..	.....	.....	.....	9	Sept	$200	Cert. or Degree
Ashford General Hospital, White Sulphur Springs, W. Va.	Carl Levinson	Agnes P. Snyder	†	6	FebAug	None	Certificate	..	.....	.....	.....
University of Wisconsin Medical School, Madison[1]	Elizabeth Grimm	Margaret Kohli	a-b-c	..	.....	....	.....	9	Sept	Varies	Certificate

*Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; H.S. = High school graduation.

†For complete information regarding entrance to Army training schools write to Major Emma E. Vogel, Director of Physical Therapists, Office of the Surgeon General, War Department, Washington 25, D. C.

[1]Male students are admitted.

[2]High school graduates accepted for a four-year course leading to A.B. degree; students admitted quarterly and tuition is $143 per quarter.

[3]High school graduates accepted for four-year college course.

[4]Nonresidents charged additional fee.

The
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A questionnaire regarding postwar plans and educational desires has recently been sent to all of our members in the armed forces.

Although the mailing of the questionnaire has not been completed, a number of returns are in. A spot check of the first forty shows some interesting figures:

For further training	35
Toward a degree	24
(Sixteen of these were toward an advanced degree)	
Subjects listed	
Anterior poliomyelitis	18
Cerebral Palsy	8
Electrotherapy	10
Basic science	16
Orthopedics	19
Arthritis	4
Other—	
X-ray reading	1
Occupational therapy	1
Review of regular exercises	1

Further breakdowns will be made and the tables will be published in the REVIEW. They also will be sent to the Council on Medical Education and Hospitals of the American Medical Association and to the approved schools for advice and organization of the courses. Every effort will be made to meet the needs as shown in the results of the questionnaires.

Annual Meeting—Executive Committee and House of Delegates

The annual meeting of the Executive Committee will be held June 20 to 24, 1945, at Bear Mountain Inn, Bear Mountain, N. Y. The House of Delegates will meet on June 22 and 23, 1945.

Constitutional amendments will be sent out in the next news letter.

Illinois Chapter

The "coming of age" of the Illinois Chapter of the American Physiotherapy Association was celebrated at the April meeting by the presentation of a saga telling the story of the chapter's development. Bess Searls was the author of the cleverly written poem which recounted many of the interesting activities of the early days. Reference to the sale of Green Oil Shampoo, which financed the convention delegates, caused much merriment among those who remembered that endeavor. Our records show that many who are prominent in physical therapy had a great share in building our chapter and we are very proud of them.

Corsages were presented to the charter members, and a beautiful birthday cake lighted with twenty-one candles was enjoyed by the group.

Ohio Chapter

The Ohio Chapter held its annual meeting at the Tudor Arms Hotel, Cleveland, Ohio, May 4 and 5, 1945. The program included visits to the physical therapy departments of the Cleveland Clinic, Mt. Sinai Hospital, Association for the Crippled and Disabled, and Crile General Hospital. Topics of discussion included "Common Skin Diseases" by Dr. George Binkley, "Nerve Lesions and Grafting" by Captain Ruchin, "Arthritis," and others.

The Department of Physical Therapy of Northwestern University Medical School has been changed to the Department of Physical Medicine. Dr. H. D. Bouman, formerly of the University of Rochester, Rochester, New York, has been appointed to the staff of the department as an assistant professor.

James Ward

Word has been received that Mr. James Ward of 16 Hancock St., Bedford, Mass., who was a member-at-large of the American Physiotherapy Association, died in November 1944.

National Foundation for Infantile Paralysis:

Physical Therapy Program

The greatest impetus to the development of the physical therapy profession in twenty years has been given by the National Foundation for Infantile Paralysis, which recently announced a $1,267,600 program for the training of urgently needed physical therapists.

More than $1,000,000 will be spent for tuition, books, maintenance, and transportation if necessary, of some 600 to 1000 new physical therapy students. In addition, at least sixteen new instructors in physical therapy will be trained under National Foundation fellowships. The spotlight will be focused on the profession as never has been done in the past.

The results of increased public awareness of what physical therapy is and how it is used and the stress laid on high standards for training physical therapists can only result in increased prestige for the profession as a whole, in the opinion of Miss Catherine Worthingham, former president of the American Physiotherapy Association, who now is director of technical education for the National Foundation.

A long term and widespread information program already has been launched by the National Foundation in connection with its physical therapy appropriation. Newspaper stories, magazine articles, radio broadcasts, demonstrations and speeches, as well as distribution of literature to potential candidates for scholarships and to the general public are being planned. Cooperation of all members of the American Physiotherapy Association is earnestly requested by Miss Worthingham.

"Busy as all physical therapists are today, I know it is not asking too much of my fellow members of the profession to lend their support to the information program in whatever part of the United States they may be," said Miss Worthingham. "County Chapters of the National Foundation, universities and colleges, civic and women's clubs, hospitals with physical therapy departments and numerous other groups will be asking for speakers and for therapists to give demonstrations. By responding to these requests in your own community you can render definite service to your own profession and create a better understanding of the use of physical therapy in this country."

The appeal to men and women with proper prerequisites for entrance into approved physical therapy schools is of primary importance, of course. But equally important is the recruitment of candidates for the teaching fellowships which are offered. This latter part of the program depends for its success upon the now existent qualified physical therapists, for it is from their ranks that the National Foundation is seeking people to take further training to equip them to teach new students of physical therapy. The American Physiotherapy Association is cooperating closely in this project.

Applicants for the teaching fellowships should:

a) Definitely plan to enter the teaching field.
b) Be a candidate for B.A., B.S., or an advanced degree.
c) Present credentials, including transcripts, experience references and the type of program desired.
d) Plan a program of part time teaching and advanced study, of not less than one or more than two years duration.
e) Plan a program including some advanced basic science and at least one course in educational methods.

The stipend for the fellowships is $2000 per year plus tuition.

Those interested should write to the American Physiotherapy Association or to the National Foundation headquarters, 120 Broadway, New York 5, N. Y. (Telephone Beekman 3-0500).

The National Foundation also requests that any material bearing on new uses of physical therapy in any of its forms be called to the attention of Miss Dorothy Ducas, who is in charge of the National Foundation's physical therapy information program. Examples of specific cases which have benefited by physical therapy treatment, biographies of outstanding physical therapists, uses of physical therapy in new fields of medical care, as well as educational photographs for dissemination to the general public would be welcomed.

Physical Therapy and Teaching Unit in an Infantile Paralysis Epidemic Area

As an aid to localities in which a large number of infantile paralysis patients appear and in which trained personnel is not available, it is proposed to set up four physical therapy aid units after the following plan:

1. Units are organized in the physical therapy schools at Harvard Medical School, D. T. Watson School of Physical Therapy, Northwestern University Medical School, and Stanford University, Division of Physical Therapy. They will be sent for periods of approximately six weeks into an epidemic area.

This service will include:

A. Assistance in organizing the local hospital facilities for the care of acute cases.

B. A course of instruction for physicians in the area in the care of infantile paralysis, of four or five days duration.

C. A course for physical therapists, both local and others who may wish to come in for training, of four or five weeks duration.

D. A course in the nursing care of the infantile paralysis case, including the respirator, of one or two weeks duration.

2. Such a unit will consist of:

A. A physician who is familiar with the care of the infantile paralysis case who can teach the physicians of the area, assist with the medical care of patients and the course for physical therapists.

B. A nurse with experience in the nursing care of infantile paralysis to give instruction in nursing procedures, including the respirator.

C. Two physical therapists; one to assist immediately with the care of the acute cases; the other to assume responsibility in relation to the training course for physical therapists and to assist with demonstrations in the physician's course.

3. Advantages of such a plan:

A. The epidemic area would receive prompt, planned service from a teaching institution.

B. The area of the epidemic will be left with trained personnel to carry on the care of the residual cases.

C. The matter of records could receive better attention because definite planning could be done ahead of time and personnel trained in their use could instruct those in the area.

Infantile Paralysis—1945: An Appeal for Physical Therapists

Will you be available for service in an epidemic area this summer? We must be ready to meet the emergency. As you know, poliomyelitis strikes swiftly and we cannot fully anticipate the locale.

Epidemic aid units are organized and are described in the adjoining column. If you can be released from your work for a month, six weeks or longer, will you write immediately to your National Office? Give the dates when you can be called upon, together with present employment and experience in order that your services can be used to the best advantage.

This is an opportunity to give real service and at the same time enrich your experience in the early care of anterior poliomyelitis. Travel, $175 a month and maintenance will be paid, through funds provided by the National Foundation for Infantile Paralysis.

Write now! There is an immediate need.

Technical Personnel in Hospitals

The annual report on technical personnel in hospitals is presented elsewhere in this issue (J.A.M.A., 127:13). An enormous increase in numbers of technicians in hospitals has occurred during the war years. This closely parallels the increase in bed capacity (30.6 per cent) and total admissions (38.3 per cent) since 1941. With the rapid pyramiding of technical helpers it has been necessary, in many instances, to employ some whose efficiency is limited by inadequate training and experience.

Two problems are paramount: Those now employed who have not had the benefit of satisfactory instruction must receive additional training; approved schools must produce sufficient graduates to supply hospitals and other employers with a normal increase in personnel and replacement of those no longer serving as technicians.

The medical record librarians in particular have been studying the problem of improving the large number of new employees in their field. Plans have been outlined to start an "in-service" type of training for those workers so that hospitals can improve the service that is rendered. In addition to the number of record librarians employed in 1941 almost ten times the total number of graduates in the last three years have been added to hospital staffs. Some of the other groups are apparently handicapped in outlining a similar program, since their standards would necessitate

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the inclusion of certain college subjects.

The second problem, that of increasing the number of graduates, is even more difficult to solve. A comparison of the increased employment of technical personnel with the annual graduates of the approved schools demonstrates the magnitude of this problem. With the diversion of increasing proportions of all workers into war industries it is unlikely that sufficient students can be enrolled in the approved schools to supply the annual increase in employed technical personnel. Reports on data collected from technical schools approved by the Council on Medical Education and Hospitals are also included in this issue.

In two important divisions increased employment has noticeably lagged behind the increase in annual admissions. Occupational therapists have been increased only 20 per cent over the 1941 report and physical therapists only 28 per cent in the same period. Hospitals are particularly in need of comparatively larger numbers of occupational and physical therapists. Both are needed by the armed forces. An additional four to six hundred qualified graduates in each group might easily be absorbed by hospitals and still not exceed the ratio to total admissions maintained in 1941.

The other groups whose work increased in proportion to the total admissions have been augmented by 40 per cent or more. These groups include clinical laboratory and x-ray technicians, medical record librarians, medical stenographers and pharmacists. Although the increase in personnel in record departments has been proportional to admissions since 1941, approximately 90 per cent of the added group have had insufficient training. Larger numbers of qualified graduates must be produced by the approved schools for medical record librarians and other technical personnel.

Graduation Exercises at Walter Reed General Hospital

On April 9, 1945, graduation exercises were held in the Red Cross Auditorium at the Army Medical Center, Washington, D. C., for student and apprentice physical therapists who have completed training courses conducted at the Walter Reed General Hospital.

Students and apprentices marched in to music provided by the Post Band. After the invocation by Chaplain Feltham James, the exercises were opened by an introduction from Col. George Callender, Assistant Commandant. Major Emma Vogel, Director of Physical Therapists, then delivered an address to the graduating classes. Following the address, certificates were presented by Major General Shelley Marietta, Commandant, to 18 graduates of the 6 months student physical therapy training course. The 9 graduates of the apprentice course then took the oath of office for commission as 2nd Lieutenant, A.U.S., and assignment to the Medical Department as a Physical Therapist, and were presented diplomas by Major General Marietta.

The ceremony was concluded by the benediction pronouced by Chaplain Antonine Barrett, followed by the playing of the national anthem.

A guest of honor at these exercises was Lt. Brunetta Kuehlthau, Medical Department Physical Therapist recently liberated from the Japanese prison camp at Santo Tomas, Philippine Islands. Lt. Kuehlthau is a former graduate of the physical therapy course at the Walter Reed General Hospital.

The text of Major Vogel's address follows:

"General Marietta, General Calendar, Major Rose, members of the graduating class, physical therapists and friends.

"I consider it an honor to be here today to participate in this graduation program. I have just returned from an inspection of physical therapy activities in our hospitals in the European and Mediterranean theaters of war. In the course of my travels we were thrilled one day to pick up a copy of 'Stars and Stripes' and to read of the progress of the war in the Philippines. When we returned to Paris we were informed that during our absence the liberation of our prisoners there had been accomplished after three years of internment. Needless to say I was overjoyed, for in the group liberated was a physical therapist, a former Walter Reed graduate who had made an outstanding contribution, carrying on her physical therapy work in the prison hospital. The story of these courageous women who have won the admiration of all Americans will go down in history. It is now my great privilege to welcome back to Walter Reed and to present Lieut. Burnetta Kuehlthau.

"Had I known I was to participate in this program, I am sure that the physical therapists whom I saw overseas would have sent their good wishes, for they were all concerned over the increasing load that physical therapists were carrying in our hospitals in the United States. I pointed out that they had no small share in keeping the physical therapy load here at a minimum. It is my belief that the most important function of physical therapists in our overseas hospitals is to demonstrate to the medical world the value of early exercise and static contraction of muscles

to prevent atrophy and deformity. This is not always easy to do, for when the wounded are being brought in by the hundreds, early surgical and nursing care are of primary importance.

"I was very much pleased to see our physical therapists actually seeking work. Although their days are already full, in many hospitals, they have gone to the orthopedic surgeons and begged to be permitted to do more. I saw large wards of patients exercising joints and contracting muscles under the direction of a physical therapist who was spreading good cheer and sunshine as she worked.

"Physical therapists overseas are also making history by their demonstration of resourcefulness. I saw all sorts of locally constructed equipment—even saw a bicycle made almost entirely of wood which was almost as efficient as expensive factory-made equipment in use here in the United States.

"A few hospitals overseas are located in buildings as modern as our own, some in converted Army barracks, others in former school buildings and even some excellent ones are operating in tents. I was proud of the work being accomplished in our hospitals. As we traveled and saw our efficient system of evacuation of patients, saw our Medical Department personnel working day and night to administer to our fighting men, saw wards and wards of happy, well cared for patients, saw endless convoys of supplies being moved, saw bridges and highways being rebuilt, saw miles of pipe lines in their serpentine course across countries, I was *proud* to be *an American.*

"Too, I was tremendously proud to be privileged to wear the uniform of an officer in the Army of the United States. Some of our younger officers do not realize that the military status means something more than wearing a uniform. You are about to be commissioned second lieutenants in the Army of the United States and assigned as Physical Therapists in the Medical Department. You therefore will have the dual status of officer and Medical Department Physical Therapist, but above all you will have the responsibility of giving to our fighting men your best efforts in rehabilitating them in order to enable them to resume their rightful place in the postwar period. You are entering on a life of unusual experiences, hard work, and service which will be compensated by the knowledge that you have contributed in no small measure to the patient's comfort and eventual recovery.

"I must admit that I am envious of you for you have so much in store for you. Now in closing, may I wish that you here and now pledge yourselves to a life of service so that many an American soldier will be a better man physically and mentally because you have been here today."

Lt. Brunetta Kuehlthau Returns to U. S. A.

On February 5, 1945, word was received of the liberation of 68 American women following the re-capture of the Santo Tomas prison at Manila, Philippine Islands. Released with this group, after nearly three years internment by the Japanese, was Lt. Brunetta Kuehlthau, Medical Department Physical Therapist with the U. S. Army.

Lt. Kuehlthau

Lt. Kuehlthau was born in West Bend, Wisconsin. She was graduated from the University of Wisconsin in 1925 and from the Physical Therapy Course at Walter Reed General Hospital, Washington, D. C., in 1927. During the following years the geographical range of her professional activities has been extensive. With the Medical Department of the Army she has served at Fitzsimons General Hospital, Denver, Colo., and Walter Reed General Hospital, Washington, D. C. Her experience in civilian hospitals has included positions in Honolulu, Hawaii, and Ancon, Canal Zone.

In January 1940, Lt. Kuehlthau was assigned to the Sternberg General Hospital in Manila. Two years later the United Press published a letter dated Jan. 21, 1943, which she had written to her parents from the besieged fortress of Corregidor. She was among those who had been moved from the Sternberg Hospital the day after Christmas, six days before Manila fell. Her letter told of the sudden quiet following the recent severe bombardment and of the comparative safety of their situation at that time. She urged her family not to worry and expressed confidence in their eventual safe return.

In the summer of 1943 a short-wave radio broadcast from Tokyo, bringing messages from American Prisoners of War, included word from Lt. Kuehlthau. It was reported that she was well and working every day.

Immediately following her release from prison,

Brunetta Kuehlthau was notified of her commission as 2nd Lieutenant in the Army and her promotion to the grade of 1st Lieutenant.

On February 12, 1945, transport planes took off from Manila loaded with the homeward bound "Angels of Bataan." News of their sojourn in San Francisco, while awaiting plane transportation to their homes, was brought by the San Francisco "Call-Bulletin" in an article entitled "Freedom: A Lot of Little Things—to Angels of Bataan." From this story, an account of a tour of the city made by three of the "Angels" (including Brunetta), it was evident that the girls were in good health and that they were thoroughly enjoying their return to freedom and civilized living.

Brunetta has been spending her leave with her family at 120 - 6th Ave. S., West Bend, Wisconsin. Early in April she paid a visit to Washington, D. C., arriving in time to attend the graduation exercises of the physical therapy courses at the Walter Reed General Hospital, her former school. Her safe return to this country has been welcome news to all who knew of her internment.

Brunetta's account of her experiences follows:

"Prior to the declaration of war, the Physical Therapy Department at Sternberg General Hospital in Manila occupied one room, large enough to accommodate five treatment tables, and was situated adjacent to the operating pavilion. When war was declared, however, and battle casualties began to pour in, it was deemed advisable to suspend physical therapy activities for the time being in order that additional space could be made available for the immediate surgical needs.

"On Dec. 26, 1941, a group of hospital personnel was sent to Corregidor where we immediately went on duty in the Malinta Tunnel Hospital. Because of the crowded conditions and lack of freely circulating air some of the patients and personnel had skin diseases which responded in varying degrees to ultraviolet ray therapy.

"I was transferred to Hospital No. 2 in Bataan on Feb. 8, 1942. This was a typical jungle hospital out in the open with two swift streams flowing by. When I arrived the beds were set up and the wards laid out. By the time of the surrender on April 8, 1942, the bed capacity had risen to over 1,000 patients.

"Naturally, no equipment was available and all physical therapy treatment was confined to massage and exercise. I had one able assistant, a medical corpsman, who had served with me at Sternberg General Hospital prior to the war. With his help we set up a physical therapy clinic in a tent near the operating room. The furniture consisted of a few small tables and several beds.

"Each day until noon I was busy making rounds on the wards, treating bed patients and checking on new orders for treatment. The afternoon was spent treating the ambulatory patients in the tent. We, the corpsman and I, treated from 100 to 140 each day. With this large number of patients, our chief concern was to check on their progress and manner of performing the prescribed exercises, spending more time with the patients whose casts had been recently removed or whose wounds were newly healed, and with the bed patients, than with the ambulatory cases. I know that our efforts were wholly inadequate, but I sincerely believe that patients were much benefited in the two months before the surrender.

"Upon our return to Corregidor, the hospital was so busy that physical therapy was out of the question and my efforts were directed toward whatever field in which I could be of use. Even after the surrender on May 26, the hospital routine proceeded as usual. We moved to the old hospital on the hill where we spent one week prior to our transfer to the Santa Catalina Dormitory, which was situated across the road from the Santo Tomas Internment Camp.

"On August 24, 1942, I was one of the group transferred from Santa Catalina Dormitory to Santo Tomas. Because of my previous experience I was assigned to the supervision of the physical therapy department of the camp hospital. This hospital was conducted for the inhabitants of the camp, of which the population was between 3,000 and 4,000. The types of cases and the size of the patient load varied in much the same degree as would be the case in any community of similar size. The average number of patients treated in the physical therapy department was 30 a day, two-thirds of whom were treated in the morning; the remainder in the afternoon. With the limitation of space and equipment, this apparently light schedule presented more problems than would have arisen under other circumstances. As far as possible, we saved our one room for the exclusive use of women patients in the afternoons. With the assistance of a male internee, I attended to the morning clinic. A civilian nurse treated the afternoon patients.

"At first our equipment consisted of one treatment table, a small ultraviolet lamp, an electric iron and hot water. Hot towel compresses provided satisfactory heat in most cases. In back conditions, the iron usually was more effective. The part to be treated was covered with a sheet and two layers of blanket. The process was similar to ironing, except that it was necessary to withhold some of the weight of the iron. In the course of time, our equipment gradually was

supplemented. An additional treatment table relieved the situation considerably. Former residents of Manila, among the internees, donated home-model sun lamps and heating appliances. A combination infra-red-ultraviolet machine was put to good use as long as the carbon lasted. Replacement of expendable parts was a problem which became increasingly severe. Three extra burners greatly extended the period of usefulness of a home-model mercury vapor lamp. The camp electrician equipped a sun lamp so that it could be used with an ordinary 200 or 300 watt bulb, enabling us to continue using it throughout our period of internment. The gift of a portable short wave diathermy was received with mingled emotions, our pleasure in possessing it being considerably tempered by our constant fear of losing it to the Japanese.

"Apart from the routine types of cases familiar to any physical therapy clinic, our greatest problem was trichophytosis, commonly known as 'tropical itch.' Cases complicated by infection were treated as follows: During the first 48 hours of hospitalization, hot wet dressings were applied continuously. After this preliminary period these patients were sent to the physical therapy clinic for daily treatment. Twenty minutes of soaking in a strong potassium permanganate solution was followed by a thorough cleansing of the area, in which all necrotic skin was removed, ultraviolet light was administered, followed by the application of sulfanilamide powder, covered by a dry dressing. This treatment was continued as long as the infection persisted. The soakings and dressings were continued until all open areas were healed. Upon discharge, patients were given a can of issue Army foot powder and instructions for future hygienic care of the feet, with emphasis upon the importance of keeping them dry. The treatment, though effective, was not infallable, and there were occasional recurrences. At first we attributed this to dietary deficiency, an explanation which was later disproved when the number of cases decreased simultaneously with the diminishing of the rations.

"I enjoyed the work. As was the case with all of us, it was our work which kept us from getting downhearted and discouraged, besides making the time pass more quickly. Never, for one moment, did we doubt the certainty of our eventual release. We knew that some day our own troops would set us free and bring us home again. Our faith in the U. S. armed forces was unbounded. During this period of internment, I had learned that through the recent Bill authorizing commissions for physical therapists, I had become a part of this great body of which we all were so proud.

"Our trip home was perfect in every detail. And when at last we stood on U. S. soil again, I think we all felt that we had really learned what it means to be an American."

Army Promotions

The Surgeon General of the Army announces the promotion of the following Medical Department Physical Therapists to the grade of First Lieutenant:

Akers, Anne—Overseas
Alderman, Ethel—Overseas
Andrews, Bertha—Overseas
Aul, Dorothy—Overseas
Baldwin, Catherine—Overseas
Barfknecht, Marion—Overseas
Beard, Margaret—Overseas
Benner, Wilma—Overseas
Blair, Katherine—Overseas
Bradley, Ruth—Overseas
Brady, Adelaide—Station Hospital, Fort Mason, Calif.
Bunch, Myrtle—Overseas
Busch, Alice—Overseas
Bush, Rachael—Overseas
Campbell, Muriel—Overseas
Chapman, Naomi—Station Hospital, Camp Wolters, Texas
Chatfield, Ruth—Overseas
Clancy, Mary—Overseas
Coeling, Ethel—Overseas
Cole, Mary—Overseas
Collier, Florence—Torney General Hospital, Palm Springs, Calif.
Cross, Elsie—Overseas
Doolittle, Hope—Overseas
Drexler, Mary—Station Hospital, Camp Pickett, Va.
Dronberger, Barbara—Overseas
Dykins, Dora—Overseas
Ehlers, Christine—Overseas
Eiden, Marion—Overseas
Emory, Elizabeth—McGuire General Hospital, Richmond, Va.
Evans, Florence—Overseas
Fassett, Barbara—Overseas
Fiwchuk, Katie—Overseas
Forsyth, Rosemary—Baxter General Hospital, Spokane, Wash.
Fortune, Isabel—Overseas
Foy, Mabel—Overseas
Golden, Elsie—Overseas
Goodman, Harriette—Overseas
Guillot, Bertha—Overseas
Guyer, Clara—Overseas
Hackett, Elizabeth—Overseas
Hagesfeld, Jean—Overseas
Hamilton, Laversa—Overseas
Hill, Patricia—Overseas
Hoag, Dorothy—Fitzsimons General Hospital, Denver, Colo.
Holton, Gwendoline—Overseas
Hook, Ruth—Overseas
Hornung, Gertrude—Overseas
Jacoby, Estelle—Overseas
Johnston, Helen—Overseas
Jones, Alice—Overseas
Jones, Elizabeth—Overseas
Karpick, Catherine—Overseas

Kirkpatrick, Elizabeth—Overseas
Kruger, Jean—Station Hospital, Fort Leonard Wood, Mo.
Kuehlthau, Brunetta—On leave
Kummer, Hildegarde—Overseas

Lange, Elsa—Overseas
Larson, Annette—Overseas
Larson, Ruth—Station Hospital, Fort Lawton, Wash.
Laur, Helen—Overseas
Lenz, Genevieve—Army and Navy General Hospital, Hot Springs, Ark.
Lieberman, Oliver—Overseas
Lock, Dorothy—Overseas

McLaughlin, Ida—Overseas
McPhail, Carolyn—Overseas
Mahard, Cynthia—Overseas
Martin, Marguerite—Overseas
Mayerle, Angela—Mayo General Hospital, Galesburg, Ill.
Menzel, Mary—Fitzsimons General Hospital, Denver, Colo.
Moldaw, Sylvia—Overseas

Newman, Ronnie—Overseas

O'Connor, Nola—Overseas
Otto, Ruth—Overseas

Pace, Robin—Percy Jones General Hospital, Battle Creek, Mich.
Peters, Alice—Fitzsimons General Hospital, Denver, Colo.
Piron, Helen—Overseas
Pitman, Barbara—Overseas
Price, Carla—Overseas

Ramsey, Constance—Overseas
Rand, Flora—Overseas
Redwine, Bette—Overseas
Reed, Shirley—Madigan General Hospital, Tacoma, Wash.
Reeves, Evelyn—Convalescent Hospital, Camp Upton, N. Y.
Rice, Zulette—Overseas
Robertson, Susan—Overseas

Sampson, Eunice—Overseas
Sargalis, Ida—Overseas
Saur, Elizabeth—Overseas
Schallau, E. Bibiana—Station Hospital, Camp Cooke, Calif.
Schemmel, Sarah—Overseas
Scherzinger, Bernice—Overseas
Schroeder, Alma—Overseas
Schwant, Leona—Baxter General Hospital, Spokane, Wash.
Seavey, Alberta—Overseas
Seither, Norma—Overseas
Sillery, Marguerite—Overseas
Soderholm, Alma—Overseas
Soltz, Belle—Overseas
Stewart, Marjorie—Overseas

Toms, Helen—Overseas
Truitt, Mildred—Overseas
Turner, Dorothy—Overseas

Urton, Frances—Overseas

Wadsworth, Gladys—Percy Jones General Hospital, Battle Creek, Mich.
Weinberg, Sylvia—Overseas
Wenhart, Elizabeth—Percy Jones General Hospital, Battle Creek, Mich.
Wigle, Ruth Kremers—Army Medical Center, Washington, D. C.
Wilcox, Pauline—Overseas
Windham, Georgiana—Brooke General Hospital, Fort Sam Houston, Tex.
Winston, Helen—Fitzsimons General Hospital, Denver, Colo.
Winter, Florence—Overseas
Wortman, Olive—Overseas

New Members

The following are new members of the American Physiotherapy Association:

Archie, Fern, 135 N. Charter, Madison, Wis.
Baron, Mrs. Henrietta W., 23-57 31st Drive, Astoria, L. I., N. Y.
Becker, Robert D., 4700 Georgia Ave. N.W., Washington, D. C.
Bell, Mrs. Jeannette P., 231 Washington St., Belmont 78, Mass.
Copeland, Velda B., Hammond Gen. Hosp., Modesto, Calif.
Coyner, Katherine R., Dibble Gen. Hosp., Menlo Park, Calif.
Crafts, Mary L., England Gen. Hosp., Atlantic City, N. J.
Craig, Mary S., Box 227, Florence, S. C.
Davis, Harriette, 200 S. 15th St., Camp Hill, Pa.
Dimmitt, Lyndall L., 1592 W. 46th St., Los Angeles 37, Calif.
Fisher, Cecile, 1800 Dryades St., New Orleans, La.
Franzenberg, Ruth, Mayo Gen. Hosp., Galesburg, Ill.
Haines, Caroline, Hammond Gen. Hosp., Modesto, Calif.
Kruger, Jean E., Lt., Regional Hosp., Ft. Leonard Wood, Mo.
McGrath, Lt. M. Virginia, Overseas.
Moore, Jean Hilliard, 67 Overlook Drive, Valhalla, N. Y.
Moorer, Ada Louise, 603 5th Ave. S.W., Rochester, Minn.
Newell, Norvaile Naomi, Welch Conv. Hosp., Daytona Beach, Fla.
O'Connor, Lt. Nola Belle, Overseas.
O'Neill, Mrs. Esther, 162 Migeon Ave., Torrington, Conn.
Ott, Katherine, Hotel Dauphin, 67th & Broadway, New York 23, N. Y.
Peters, M. Theresa, Box 146, Pacific Grove, Calif.
Pierce, Frances, 319 Fifth Ave. S.W., Rochester, Minn.
Pinkerton, Floy, 176 Raleigh St., Rochester, N. Y.
Pitre, Ethel E., Wm. Beaumont Gen. Hosp., El Paso, Tex.
Ryssy, Irja R., Ashford Gen. Hosp., White Sulphur Springs, W. Va.
Sacksteder, Lt. Mary Ellen, Crile Gen. Hosp., Cleveland 9, Ohio.
Speltz, Elizabeth, 498 E. Davant St., Memphis, Tenn.
Vasey, Charlotte M., Nichols Gen. Hosp., Louisville 2, Ky.
Winn, Elizabeth H., Cummings Hosp. School, Mt. Clemens, Mich.
Wood, Gladys G., Valley Forge Gen. Hosp., Phoenixville, Pa.

Recent Graduates of Station Hospital, Fort Huachuca, Ariz.:

Jones, Ruth R.
Lockhart, Bernice P.
Rogers, Anna L.
Taylor, Valjeanne Henrie

Recent Graduates of Children's Hospital Society, Los Angeles, Calif.:

Auflick, Bernice
Brown, Mrs. Elinor W.
Burley, Lily Durand
Dandridge, Jean
Harrison, Mildred Louise
Kappas, Jacqueline Jean
Makin, Doris M.
Naranche, Dolores W.
Nelson, Viola E.
Paddock, Mary J.
Paine, Mary I.
Randall, Leila C.
Szymanske, June Louise

Recent Graduates of University of California, San Francisco, Calif.:

McCullough, Margery S.
Melnicoe, Mrs. Mabel D.
Signa, Mrs. Maude M.

Recent Graduates of Walter Reed General Hospital, Washington, D. C.:

Abel, Christine C.
Adams, Rheta Carolyn
Arheit, Margaret D.
Barthel, Dorothea W.
Bateman, June A.
Bender, Catherine M.
Brigham, Agnes A.
Crawford, Leah K.
Flynt, Mrs. Jane C.
Hinderer, Mildred V.
Kenyon, Elaine K.
Kershaw, Helen Jean
McFadden, Marie
Morford, Mrs. Vera M.
Morrow, Mrs. Elizabeth A.
Pierce, Abigail E.
Pritchett, Mrs. Betty
Reardon, Janet H.

Recent Graduates of Lawson General Hospital, Atlanta, Ga.:

Burt, Edith M.
Elliott, Lillian M.
Hicks, Elaine R.
Ladue, Ruth A.
McCallum, Elise
Phinney, Lois F.
Polin, Sylvia
Proctor, Betty Gray
Ramsey, Mary Esther
Romer, Anna Ruth
Scott, Audrey M.
Todd, Virginia L.
Van Alst, Helen C.

Recent Graduates of Stanford University, Calif:

King, Margaret
Osborn, Janet R.
Stewart, Ardis Bruce

Recent Graduates of Northwestern University Medical School, Chicago, Ill.:

Bosworth, Laura V.
Cipala, Marian Frances
Dickson, Lelia Frances
Fox, Gladys J.
Hintz, Lila S.
Murphy, Lorrain Jean
Nordschow, Meredith Thoe
Roby, Winnifred J.
Spencer, Sara

Recent Graduates of Harvard Medical School, Boston, Mass.:

Hedges, Edith
Janett, Anna Jeanne
MacDonald, Mary L.
Sanford, Shirley Ann
Skladal, Alice L.
Watson, Catherine

Recent Graduates of Mayo Clinic, Rochester, Minn.:

Bechtold, Virginia
Bogue, Elizabeth V.
Gorman, Eleanore
Randall, Mrs. Dorothy Avery
White, Mrs. Sarah K.

Recent Graduates of Bushnell General Hospital, Brigham City, Utah:

Barnhart, Lt. Dorothy
Brown, Lillian
Burgett, Linnia L.
Christin, Alberta E.
Gray, Lt. Ada Elizabeth
Haggard, Margaret
Harlan, Betty Ann
Johnson, Frances Jane
Lucey, Myrtle J.
Morris, Jean Durham
Sawhill, Madlyn
Sebring, Verna L.
Stranahan, Cherryol

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Parents Can Help With Speech. ELIZABETH BOSLEY. Spastic Review, March 1945.

ABSTRACTS

John S. Coulter, M.D.

The Electrical Activity of Voluntary Muscle in Man Under Normal and Pathological Conditions

G. Weddell, B. Feinstein and R. E. Pattle. In BRAIN, 67:178-257, 1944.

This paper is undoubtedly the most interesting general paper on the electrical phenomena in human muscles that has appeared in the recent literature. It is impossible to do justice to its many outstanding contributors in a short review. Electrical currents can be lead off from human muscles in many ways. The authors use a so-called concentric needle electrode, consisting of a hypodermic needle with an insulated wire inside. This electrode is introduced in the muscle to be examined. The electrical potentials obtained are very weak and have to be amplified. After this they are recorded by an oscillograph or listened to by a loudspeaker. This method of leading off results in a sharp localization; that is, the electrode used is sensitive only to action currents which have their origin in the immediate neighborhood of the tip of the electrode (max. distance ¼ to 2 cm.).

A voluntary muscle that is completely relaxed shows no electrical activity. Neither is electrical activity found in normal muscle whose motor nerve is blocked by local anesthetic even though surrounding muscles contract vigorously. Thus action potentials always mean contraction even though that may be too weak to give visual movement. Some neck muscles cannot be completely relaxed; most limb muscles can be relaxed with greatest ease. The authors devote a section to this in relation to the problem of muscle tone. They agree with Hoeffer that muscles may be under certain tension without evidence of action currents. The authors find no evidence of action currents even in rapid stretching of some muscles. This is in contradiction to the results of others who find at least one action current spike on rapid stretching of a muscle. The fact, however, that no continuous flow of action currents occurs during rest or passive stretching of a normal muscle appears definitely established. This does not mean that a constant stream of action currents does not indicate an increased muscle tone as, for instance, in Parkinson's disease. Other evidence that "tone" does not always parallel electrical activity in the muscle is found in patients with unilateral nerve lesion. The denervated and flabby muscle often shows more electrical activity than the normal one. The authors suggest that tone may be due to the amount of fluid within the muscle sheath or to special properties of the muscle fiber which may or may not be accompanied by electrical activity.

Most important is the authors' discussion of the electrical activity of denervated muscle. It is well known that the denervated muscle shows fibrillation. It is well to bear in mind the sharp distinction between fibrillation and fasciculation. Fibrillation is independent contraction of individual muscle fibers. The contractions are small and extremely fast; they are accompanied by a small and very short action potential which sounds in a loudspeaker like a short high-pitched click. Fasciculation on the contrary is due to the activity of one motor unit; that is, all the muscle fibers (150-200 or more) which are innervated by one nerve fiber. The contractions of fasciculation are, therefore, stronger and of longer duration than those of fibrillation. The action currents also are stronger and last longer and sound in a loudspeaker like a low-pitched sound. The authors recognize this difference between fibrillation and fasciculation very clearly and everybody with experience in this field will most heartily endorse them.

Fibrillation occurs a few weeks after denervation and lasts until reinnervation takes place. Fibrillation action currents will often be found even though its mechanical equivalent is too weak to be seen. In a series of 100 cases the potentials were never absent.

It should be noted that it is sometimes possible to obtain fasciculation potentials in cases of completely severed nerves. These must be due to irritation of peripheral nerve sections.

Fibrillation potentials have been recorded eighteen years after an attack of infantile paralysis. It also can be recorded in partially severed nerves. The finding of fibrillation potentials then indicates the presence of denervated muscle fibers. If they cannot be found they can sometimes be produced by the application of heat or by the administration of prostigmin. Muscles which have been given adequate physical therapy treatment

show strong fibrillation, while without treatment fibrillation is only weak. The authors, however, stress the fact that they confirm the work of others that fibrillation bears no relation to atrophy and that an increase in fibrillation does not result in a decrease or prevention of atrophy. Equally important is the examination of the electrical phenomena during reinnervation. The authors show that before recovery becomes clinically visible, evidence of reinnervation can be seen in the action current picture. This is seen in the appearance of action current groups of the motor unit type. At about the same time the fibrillation action currents begin to disappear. The action current picture thus allows one to make the diagnosis of recurring innervation before any other sign of recovery has occurred. The reinnervation potentials sometimes sound like fibrillation potentials except for their frequency. Sometimes they sound like fasciculation potentials and sometimes they have a very characteristic sound due to the fact that they are polyphonic. Nevertheless the recognition of the earliest moment of reinnervation should give no difficulties if the patient has been examined at regular intervals. These potentials when they first appear cannot be sustained by voluntary effort and precede clinical evidence of recovery. Prostigmin facilitates neuromuscular transmission in early stages of recovery.

In cases of reversible ischemic block, motor unit action currents always can be found but fibrillation action currents are found only rarely. This confirms results of earlier workers. The presence of fibrillation action currents also is very useful in the recognition of a lower motor neuron lesion. Finding of fasciculation action currents does not necessarily exclude a lesion to the motor neuron as it may be found in some peripheral lesions due to excitation at the neuromuscular junction. The positive finding of fibrillation action currents however indicates a lesion somewhere in the lower motor neuron. Here again the sharp distinction between motor unit (fasciculation) action currents and individual muscle fiber (fibrillation) action currents is extremely important. A comparison is made between some phenomena described for the motor nerve and similar phenomena in the sensory nerves in cases of sciatica.

Clearly written case histories and good reproductions of action current records still increase the value of this most important paper.

Treatment of Gunshot Fractures of the Extremities in Evacuation Hospitals of the U.S.S.R.

Prof. Nikolai N. Priorov. In BRITISH MEDICAL JOURNAL, No. 4388:178, February 10, 1945.

In wartime the treatment of bone injuries has exceptional significance. According to data from Soviet hospitals fractures of the extremities constitute 38 per cent of all wounds encountered during the present war. If fractures of the skull, face, spine, and ribs are added to this figure the total reaches 45 to 47 per cent, or almost half of all wounds incurred at the front. Correct fracture treatment must involve not only restoration of lost function but restoration of fighting capacity as well and the return of an experienced and tried soldier to the Army.

Wartime gunshot fractures have these features:

1. They are open, compound, and complicated by infection.

2. Like closed fractures, they are accompanied by displacement of bone fragments.

3. They are associated with extensive destruction of soft tissue, not observed in closed fractures.

4. They are often encountered as comminuted fractures, with a large number of splinters scattered throughout the area surrounding the wound.

5. Wounded men with bone fractures are unavoidably subject to many-staged treatment in various stations and centers, beginning with field hospitals and ending in the deep rear.

6. Treatment is protracted and the results are less satisfactory than in treatment of closed fractures.

Considerable importance is attached to good nutrition and the prescription of vitamins. At the earliest moment that the patient's health permits, general and specialized physical therapy (gymnastics) are used in order to improve his general condition and prevent muscle debility, contractures, and limitation of joint mobility.

Brucellosis

Lieutenant Commander Harold J. Harris (MC), U.S.N.R. In ARCHIVES OF OPHTHALMOLOGY, 33:1:61, January 1945.

In cases of acute illness the most valuable aid is sulfadiazine or sulfathiazole, although neither substance may be said to be actually curative. Remission is likely to occur, at which time vaccine may be employed for the purpose of building up adequate resistance. The author feels that artificial fever therapy is overrated in some quarters, for either the acute or the chronic illness. It is successful probably in only a small percentage of cases. Much of the probable error in its evaluation has been made on the basis of too hasty a decision as to recovery and of inadequate follow-up study. However, its trial is justified in selected cases, especially those in which the disease is refractory to vaccine therapy.

In intestinal localization of infection, succinylsulfathiazole or sulfaguanidine may prove to be of greatest value, especially in prevention of relapse.

In treatment of the chronic illness vaccine made from the abortus strain alone has proved to be of greatest value in my experience.

The sulfonamide compounds are usually of little value for the chronic illness except in cases of localized infections.

The Treatment of Fractures of the Humerus With the Hanging Cast

R. Beverly Raney, M.D., Durham. In THE NORTH CAROLINA MEDICAL JOURNAL, 6:2:91, February 1945.

For about two years we have treated almost all fractures of the humerus above the supracondylar level with the hanging cast and shoulder exercises.

Active exercises form an essential part of the hanging cast treatment. The patient is trained to carry these out twice daily, beginning in a [illegible] fashion immediately after application of the cast, and continuing more vigorously until full function of the extremity is restored. The shoulder exercises are of two types, circumduction and rotation, and are carried out with the patient standing and leaning forward. In doing the circumduction exercise, the patient swings the entire extremity around in as large a circle as he can make. In doing the rotation exercise, he turns the extremity about the longitudinal axis of the humerus through as great an angle as possible. After removal of the cast—at a period varying widely from about two to about twelve weeks after its application—exercise of the shoulder in other positions is added, as are exercises of the elbow and wrist.

Low Back Pain from the Standpoint of the General Surgeon

John Beverly Moore, M.D., Benton, Ill. In ILLINOIS MEDICAL JOURNAL, 87:1:38, January 1945.

Acute Lumbo-Sacral Strain: The recumbent position usually gives relief, lying on the back or the sound side with the body and thighs slightly flexed, a pillow between the knees and some form of heat to the affected part. Add to this a firm mattress and you have good treatment. The referred pain in the leg will disappear as the back improves. They should be kept in bed as long as movement causes pain. On arising, they will be more comfortable with a tight binder and should continue heat in some form. Later, stooping and bending exercises just short of inducing pain are encouraged. The majority of these cases show no x-ray evidences of injury.

Postural Lumbo-Sacral Strains: Local heat gives these patients most relief. The patient with a pendulous or relaxed abdominal wall should wear an abdominal support. Other postural corrections should be referred to the orthopedist.

Facet Syndrome: Sudden pain in the lumbo-sacral back may be due to a slight subluxation of one or both inferior articulating processes of the fifth lumbar vertebra. These respond amazingly to manipulation measures. The procedures recommended are as follows: Patient lies flat on his back on a firm table and braces himself by holding the sides of the table. The operator, standing at the foot of the table, flexes the patient's hip and knee joints while grasping the ankle. The patient is then asked to give a violent kick, at which time the physician pulls strongly on the ankle in the line of the body. If properly synchronized, the maximum force is obtained when the leg is in full extension. Five to ten kicks may be required, depending on the amount of relief from pain and freedom of hip flexion. The kicking and pulling produces a forward thrust of the sacrum on the fifth lumbar vertebra in the opposite direction to which the slipping has occurred. Heat and rest for a few days complete the treatment with admonition to avoid movements that cause pain. After two to four weeks, stooping and bending exercises are recommended.

Sacro-Iliac Strain: Rest on a firm mattress, some form of heat, and a sacral compression dressing is good treatment. They are likely to be more comfortable on the back with a pillow under and between the knees. They are allowed up when the upright position does not cause pain. A firm binder or belt around the pelvic girdle affords some comfort. They should continue with intermittent use of heat. The recommendations for stooping and bending exercises are the same as in lumbo-sacral strains.

Contracture of the Fascia-Lata: Contracture of the fascia-lata has been suggested as a common cause of low back pain.

A high percentage of relief is reported by simple division of the ilio-tibial band above the great trochanter.

Lumbago: The treatment is heat, massage, and early activity.

Wheal-Fluorescence: A New Method of Evaluating Peripheral Vascular Diseases (Preliminary Report)

James Locke Neller, M.D., and Erwin R. Schmidt, M.D., Madison, Wisconsin. In ANNALS OF SURGERY, 121:3:-336, March 1945.

The purpose of this paper is to introduce a new and simple test which promises to be an accurate means of revealing certain fundamental facts of diagnostic, prognostic, and therapeutic importance in cases of peripheral vascular disease.

The test consists of observing the presence or absence of fluorescence in surface scratches made fluorescent by injection of intravenous fluorescein followed by inspection under specially filtered ultraviolet light.

Summary

A new, simple, and apparently reliable test for extent and degree of vascular insufficiency is introduced. Its component parts are described, and their bases in logic discussed. The equipment necessary, and the technic of performance are presented. Clinical considerations are outlined with cases to support them. It is recommended that other clinics adopt the procedure and further analyze its possibilities. A later paper is planned in which a more exhaustive evaluation will be presented.

Evaluation of Treatments in Thromboangiitis Obliterans (Buerger's Disease)

Emil J. C. Hildenbrand, M.D., Washington, D. C. In SOUTHERN MEDICAL JOURNAL, 38:3:179, March 1945.

Exercises of the Buerger-Allen type modified by Wright are indicated in all cases. Baths should be limited to compresses of saline or boric acid if ulceration and infection are present for 30 minutes twice a day. For mild cases, some of the advertised warm mineral baths are beneficial, but similar results can be obtained in a bathtub or whirlpool bath. Water will macerate poorly nourished tissues and open avenues of infection. The passive vascular exercising apparatuses are of value only when the predominant findings prove to be organic occlusion and the vasomotor have been elimir ted, as they increase blood flow through relatively rigid arteries by rhythmically increasing intra-arterial pressure or decreasing the pressure within the ischemic tissue. Ultraviolet blood irradiation brings some promise, but further investigation is necessary. Heat is very helpful in all cases, but its proper application is essential. The affected extremities should be exposed to none other than room temperature or below. A beneficial reflex vasodilatation by immersing opposite extremities in water at 113 F. may be accomplished. Local heat to the trunk by means of blankets, hot water bottles, electric pads, or heated cradles, is to be encouraged, which also accomplishes vasodilatation. Using the desired results of the typhoid vaccine treatment as a criterion for the proper treatment of thromboangiitis obliterans, the fever cabinet has been used. A patient covered with blankets and electro-magnetic cable with affected extremities exposed can expect the same result except be a little more uncomfortable because of weight on his trunk.

Medical Conditions Simulating A Surgical Upper Abdomen

A. A. Conrad, M.D., Crete, Nebraska. In THE NEBRASKA STATE MEDICAL JOURNAL, 30:1:12, January 1945.

Osteoarthritis, because of root irritation, with subsequent pain in the upper abdominal wall, may simulate an intra-abdominal lesion. Carnett's method is that of having the patient tighten the muscles of the abdominal wall with forced rigidity of the muscles. With this defense, he claims, intra-abdominal conditions are not going to prove painful to palpation, but on the other hand if the abdominal muscles are relaxed, intra-abdominal conditions are going to cause tenderness and discomfort. If there is neuralgia, pinching of the skin and subcutaneous fat with considerable force will cause rather severe discomfort, whereas if the condition is dependent upon an intra-peritoneal involvement the pain is minimal or absent.

Experimental Production of Scoliosis in Rats and Mice

John R. Schwartzmann, M.D., and Meryl Miles, M.S., St. Louis, Mo. From the Department of Anatomy, Washington University School of Medicine, and Shriners' Hospital for Crippled Children, St. Louis. In THE JOURNAL OF BONE AND JOINT SURGERY, 27:1:69, January 1945.

A satisfactory understanding of the mechanism involved in the production of scoliosis in man is yet to be fully reached. One means toward this end has been to create this condition deliberately in laboratory animals by various methods.

Conclusions and Summary

This study of experimentally produced scoliosis may justify the following conclusions:

1. Scoliosis can be produced experimentally in laboratory rats and mice by the selective release of mechanical action of different muscle groups on the vertebral column.
2. A satisfactory degree of control can be maintained to allow the prediction of the type of curve to be produced.
3. Selective muscle imbalance can be produced without muscle excision by the use of inert material to prevent muscle reattachment; this imbalance will produce lateral curvature.
4. Muscle excision and release which did not produce imbalance resulted in no scoliosis in the animals studied.

Physiotherapy of Wounds

I. A. Piontocovsky. In AMERICAN REVIEW OF SOVIET MEDICINE, 2:3:224, February 1945.

A definite plan of physical therapy can be formulated in the first stage of wound healing. The wound is irradiated with hypererythemic doses of ultraviolet rays immediately after primary dressing. Not only the surface of the wound but the surrounding tissues are exposed at a 5-10 meter distance from the source. Such an irradiation may be repeated every 4-5 days. In case of wound infection and pocketing, it is advisable to subject it to iontophoresis after primary dressing and repeat it at the next dressing.

Later, treatment may be applied by ultra high frequency current in small doses when a purulent inflammation develops. This acts as an irritant, activating the reticulo-endothelial system, both locally and systemically. Exposures are made every other day. In severe inflammation, it is sometimes expedient to apply ultraviolet irradiation on a large skin surface. Such distal irradiation has a less irritating influence upon the inflammatory process. The area to be irradiated measures about 400-500 sq. cm. Treatment may be repeated every 3-4 days. Fever is no contraindication to physical therapy.

The second stage is that of preliminary regeneration (Girgolav), or the stage of granulation tissue formation. The physicochemical processes in the wound are manifested by increased hydration in the tissues. Treatment aims to prevent the spread of infection and to accelerate granulation tissue formation. Physical therapy measures create in the wound favorable conditions which contribute to an optimum granulation formation. Ultra high frequency currents bring about a dilatation of the blood vessels and affect favorably connective tissue elements. Inflamed tissues undergo destructive processes occurring mainly in the connective tissue element. There results some specific irritating decomposition products, and tissue acidosis increases. As a result, connective tissue plastic processes become much stronger.

The dehydrative action of an ultra high frequency current when the granulation tissue is edematous and when there is hyperplasia of granulations encourages the application of more powerful doses. When granulations are dry and reduced in vitality, it is advisable to apply physical therapy to bring about a lasting hyperemia and edema. Galvanization yields in this respect the best results.

It is necessary to stress that healing is not static, that it is a continuous dynamic process not separated by barriers. It is necessary to recognize a given stage of healing in order to apply physical therapy in a routine manner. The outward appearance of the wound, the granulations, and the state of the epithelium, are the indications for the type of therapy.

Healing is not simply an isolated process but depends on the general state and reactions of the entire organism, which also must be supported. Physical therapy also exerts a beneficial systemic effect and ultraviolet radiation is therefore of value in emaciation, malnutrition, and alimentary disturbances. In anemia, diathermy of the long bones is indicated. To increase the tone of the nervous system, hydrotherapy measures and heliotherapy are valuable.

Portable Exercise Cart

In THE BULLETIN OF THE U. S. ARMY MEDICAL DEPARTMENT, 86:36, March 1945.

The portable exercise cart illustrated is useful in building the physical stamina of patients in the class III and IV reconditioning program. This apparatus can easily be moved from one ward to another and still give nearly all the equipment of a small gymnasium. This is especially beneficial for patients who cannot do much walking and yet have energy for some other physical activity. Where lack of personnel is a problem, one or two men from the advanced reconditioning program can push the cart from ward to ward and set it up for use in five minutes. Second Lieut. Robert E. Strzelczyk, M.A.C., reports that the portable cart has been found excellent for physical training supplemental to the ordinary routine calisthenics.

The portable cart which can be easily constructed in the occupational therapy or post engineer shop is capable of providing exercise for forty-five to fifty men. The equipment consists of twelve 1-pound dumb-bells, twelve 2-pound Indian clubs, one 4-by-5-foot tumbling mat, one rowing machine, six hand grippers, three cable exercisers, twelve skipping ropes, two sets of wall pulleys, two medicine balls of 6- and 10-pound weight, and one collapsible chinning bar.

The Physical Fitness Program Needs Medical Guidance

In NEBRASKA STATE MEDICAL JOURNAL, 30:3:78, March 1945.

This is neither the time nor the place to discuss a detailed or even a skeletal program for physical fitness. There is at present, to our knowledge, no organized program, though governmental and industrial organizations, together with representatives of the American Medical Association are working toward that end. At the last Annual Conference of State Secretaries and Editors the subject received much attention. From the discussion one must conclude that there is an urgent need for the medical profession to exercise active leadership, or the whole movement will deteriorate into a universal gymnastic routine with the principal effort to train athletes regardless of individual adaptability or physiologic equipment for such an arduous career.

The Abuse of Rest as a Therapeutic Agent

In PROCEEDINGS OF THE STAFF MEETING OF THE MAYO CLINIC, 20:6:91, March 21, 1945.

F. H. Krusen, M.D., Section on Physical Medicine: Recently there has been renewed interest on the part of the medical profession in problems of rest versus activity in the treatment of the sick. Two events have contributed toward this renewal of interest. One was the presentation of a symposium on the abuse of rest at the last meeting of the American Medical Association. The other event was the establishment in our Army hospitals of convalescent and reconditioning programs which utilize physical and mental activities for patients more fully than has ever been the case in civilian hospitals.

In the past certain great medical leaders have stressed, perhaps unduly, the importance of rest as a therapeutic measure. Three vigorous advocates of rest as a form of therapy stand out in the memory of present-day physicians. They are Weir Mitchell, Hugh Owen Thomas and Allen K. Krause.

The doubts which are now being expressed concerning the wisdom of blind and often unreasoning adoption of unlimited amounts of rest in therapy, simply because of the support given to rest therapy by great physicians of a less enlightened age, call for a careful review of our modern knowledge concerning this subject.

Blind following of the great physicians of the past has always been one of the weaknesses of the medical profession. Yet in guarding against this tendency we must not hurriedly cast aside proved and valuable methods of therapy.

Practically every patient presents problems of a physical and of a mental nature—problems of the soma and of the psyche.

Our Army physicians have realized the importance of rapid restoration of sick and disabled soldiers both physically and mentally. Their newly developed convalescent and reconditioning programs bid fair to revolutionize the concepts of physical and mental rest and activity now extant in civilian hospitals.

Shovellers' Fracture

J. H. Annan, M. B. Edin. Captain RAMC. In THE LANCET, No. 6337:176, February 10, 1945.

McKellar Hall (1940) has described 15 cases of fracture of the spinous processes of the cervical or dorsal vertebrae as clay-shoveller's fracture, and Watson-Jones (1941) remarks on its rarity in Britain. So long ago as during the building of the Kiel Canal, German surgeons were conversant with this occupational injury, which they termed schipper Krankheit. Here are described 8 cases of this fracture-displacement of part of the spinous process of one or more of the 6th or 7th cervical or 1st dorsal vertebrae.

McKellar Hall (1940) recommends early excision. This seems to be unnecessary at an early stage, a view supported by the early study in Germany and by Watson-Jones (1941). In all the present cases (except No. 3, whose peculiar complications I hesitate to attribute to this fracture) there has been very little disability after a month's rest from heavy work. The case have been treated with heat and rest, progressing to graduated exercises, and at no time was there any indication for surgical removal of the fragment, which, in all probability, would cause more lasting weakness than the injury. The ultimate healing is only by fibrous union.

Refrigeration for Anesthesia and Therapy (II)

Lyman Weeks Crossman, M.D., Frank K. Safford Jr., M.D., New York City Hospital, New York. In THE MODERN HOSPITAL, 64:2:90, February 1945.

The value of reduced temperatures for operations and for treatments in military service has already been emphasized. For civilian hospitals, in addition to the miscellaneous therapeutic uses and in addition to superficial anesthesia without a tourniquet for skin grafting and similar purposes, special mention will be made of two of the newer applications of cold.

One of these is in the treatment of burns. This is the largest class of injuries that are superficial enough for refrigeration to be effective not merely on the limbs but also on the trunk. The small number of our published observations will be enlarged as rapidly as possible.

Strength Frequency Curves in Electrodiagnosis of Experimentally Produced Peripheral Nerve Lesions in the Cat

Lewis J. Pollock, M.D., James G. Golseth, M.D., and Alex J. Arieff, M.D., Chicago, Illinois. In SURGERY, GYNECOLOGY AND OBSTETRICS, 80:3:242, March 1945.

Physiologists have been interested in the stimulation of nerves and muscles with alternating currents of variable frequencies since Nernst pointed out, on the basis of his polarization theory, that the ratio between the square of the intensity and the frequency was a constant.

On the other hand, the results of stimulation of nerve and muscle by alternating current have not been employed as indications of the state of the nerve-muscle complex in disease or injury to the peripheral nervous system.

There are two observations which have been made by physiologists which are related to the use of the alternating current as an electro-diagnostic procedure. They are (1) the so-called optimum frequency or parareasonance and (2) the discontinuity of the strength frequency curve when large fluid electrodes are employed.

Conclusions

1. The threshold amperage at various frequencies in the normal, degenerating, denervated, and recovering state of muscles is described.

2. A shifting of the band of optimum frequency to low frequencies below one cycle per second is characteristic for degenerating and denervated muscle.

3. The appearance of two equally high branches of a skewed curve is characteristic of recovering muscle.

4. During early degeneration, at least three discontinuous curves may be recognized, later but two. During denervation the strength frequency curve is continuous. During regeneration it again becomes discontinuous.

Abdominal Pain in Children

Joseph Brennemann, M.D. Reading, Vt. In THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 127:12:694, March 24, 1945.

Carnet published a series of papers dealing with "intercostal neuralgia" as a source of error in the differential diagnosis of appendicitis. He maintained that if the abdominal wall was tensed by straining or by elevating the legs in the dorsal position the tenderness would disappear in appendicitis and remain in "intercostal neuralgia." I was not impressed until he showed me several cases, all, however, in adults. It is a difficult sign to elicit in children.

Physical Therapy Units and Methods Used by the Naval Medical Department (Philadelphia)

Lieutenant Commander J. L. Rudd, Medical Corps, U.S.N.R., San Francisco, Calif. In MEDICAL RECORD, 158:2:94, February 1945.

Included among the newer units and methods are the following:

(1) The local saturated-air heat therapy and the general saturated-air fever therapy units; (2) the local hydrogalvanic tanks and the general hydrogalvanic baths; (3) the hypothermia unit for refrigeration therapy; (4) mild shock therapy; (5) general fever therapy cabinets for short treatments; (6) artificial ultraviolet radiations to "desensitize" individuals to solar exposure; (7) sodium penicillin, by negative galvanism, for iritis; (8) removal of sebaceous cysts by the electric current; (9) resistive exercises, and (10) passive stretching.

Of the first 97 patients treated by local and general hydrogalvanism in the department, 25 per cent evidenced complete relief of symptoms; 45 per cent were definitely improved; 10 per cent were slightly improved; 12 per cent were considered inconclusive, since they were well one day and complained of symptoms another day, and 8 per cent were not relieved.

Local treatment.—Seventy-five of the 97 patients were treated by local hydrogalvanism, in tanks, with a total of 609 treatments, for an average of 8 treatments per patient.

General treatment.—Twenty-two of the 97 patients were treated by general hydrogalvanism, in tubs, with a total of 194 treatments, for an average of 9 treatments per patient.

Arthritis.—Twenty-eight patients between the ages of 25 and 55 years, suffering from an arthritis of from a few months to many years' duration, were given treatments for relief of symptoms. Six received no relief, 4 were marked "inconclusive," and 18 were benefitted.

Neuritis.—Veterans of this and the first world war afflicted with neuritis or neuralgic pain in the extremities received treatments in the hydrogalvanic solutions.

Combat fatigue.—A few patients suffering from combat fatigue were given treatments by general hydrogalvanism (immersed in the bath filled with the Teca tannin solution) and appeared definitely benefitted by the treatment. The small number of cases are of little statistical value but indicate that this modality should be considered in treating cases of nervous fatigue.

Poliomyelitis: A Report of Cases Seen in Dallas in 1943

John G. Young, M.D., F.A.C.P., F.A.A.P., Dallas, Texas. In TEXAS STATE JOURNAL OF MEDICINE, 60:10:529, February 1945.

Kabat and Knapp present the conception of spinal cord pathologic changes which are characterized by two types of lesions: (a) an anterior horn cell lesion resulting in motor denervation with muscle atrophy, and (b) an internuncial lesion resulting in muscle spasm.

Prostigmine was used in only a few of these patients, and its efficacy cannot be evaluated from the small series. It was accompanied by marked improvement and lessened muscle spasm in 4 cases.

It has been taught that the duration of active continuing possible spread of the disease within the nervous system is limited to only five or six days. This series disproved such teaching, for some of these cases continued to manifest new involvement with frequent thorough testing for as long as twelve days. This development was considered important in this series and should be considered in giving a prognosis.

The management of this series of patients in the hospital was greatly aided by four physical therapists sent by the National Foundation for Infantile Paralysis. The Kenny treatment was instituted upon diagnosis and carried out in detail and thoroughness with frequent competent muscle testing. All beds were provided with boards under the mattresses and foot boards where needed. All patients were given Vitamin B Complex and a diet rich in vitamins. Isolation from the rest of the hospital was rigid. There was no hospital spread of the disease. It is the opinion of those who observed this group that the Kenny treatment gave excellent results in relieving pain and making for comfort and rest. It was perceptible that these patients frequently quieted down and had relief of pain with this treatment, and if no other results were secured, this alone is a great advance in treatment. There was, however, the opinion that the Kenny treatment gave good results in preventing contractures, lessening muscle spasm and materially shortening the recovery time.

A New Treatment for Flatfoot and Other Common Foot Disabilities

Otto Meyer, New York, N. Y. In MEDICAL RECORD, 157:12:733, December 1944.

Years of experience in the treatment of flat feet have convinced me that latent thrombophlebitis in the deep veins of the leg and of the plantar veins plays the deciding role in the causation of a painful flat foot.

The most effective therapy for these conditions is the pressure bandage. The patient should walk a great deal with the pressure bandages in order to intensify contraction of the leg and foot muscles. The pressure bandage produces an automassage during walking.

Usually the patient feels relief immediately after the application of the pressure bandages. The bandages have to be changed twice a week, as they become loose as a result of decrease of inflammatory swelling. The treatment has to be continued until the deep veins can be palpated without pain.

Obvious focal infections (pulpless teeth, infected tonsils) must be removed as they "feed" latent infections in the veins.

Drop Foot Brace

In THE BULLETIN OF THE U. S. ARMY MEDICAL DEPARTMENT, 86:28, March 1945.

Two types of drop foot brace are in common use: (1) the metal brace with a drop lock ankle. This brace is cumbersome and lacks a spring. (2) The standard wire brace has a spring at the ankle. In this brace, the wire bends and may need replacement. A modification of the latter spring has been designed by Jack R. Pava, orthopedic mechanic, Hoff General Hospital, Santa Barbara, California, in which the upright is placed in front of the coil rather than behind it. Thus the weight of the foot compresses the spring instead of opening it, increases its efficiency, and minimizes the need for replacement due to relaxation of the spring or breakage.

Placing a half metal band around the calf of the leg between the uprights provides comfort and does away with the flexible strap and buckle around the anterior part of the leg, which may allow the brace to twist around the calf. With the half metal band placed posteriorly, the steel uprights remain parallel and lateral to the leg and give even tension to the foot in neutral position.

The Visionary Gleam

In THE BRITISH JOURNAL OF PHYSICAL MEDICINE AND INDUSTRIAL HYGIENE, 8:1:1, January-February 1945.

Our editorial policy is and always has been one which is based on faithful and dispassionate reporting of events in the world of medicine, with regard to physical medicine generally and to its application to the industrial world especially. In all medical progress—a complex evolutionary process with ever-changing phases — there are periods of advance and periods of consolidation; always however there are in action the sobering influences of reason, criticism and seasoned judgment to save such progress from developing into a headlong if not hysterical career of unscientific and uncontrolled hypothesis and guesswork.

We have watched rehabilitation come into view and have observed and participated in the phases through which it has passed. All the doubts, all the sneers, all the destructive criticism have been part and parcel of its rise to prominence and ultimately of its establishment as an essential in the social fabric now being woven for the postwar years. There can be no denying that rehabilitation has had some rough handling, but it is all the better for that, since it is indeed now battle-worthy and ready for application in its appropriate sphere.

We are still far from the end of our labors. Surely there can be no satisfaction until we see rehabilitation made applicable to every single individual and every single occupation, no matter who the person may be or what he or she may be doing, no matter whether the readjustment be necessary in the mental or the physical sense or whether it refer to the factory, the profession, the household, the school or any other department of human activity. The complete freedom of life itself can be achieved only by the establishment of an infallible and all-embracing system of corrections made at every level. Rehabilitation has already begun in the factories and the main flow of physical medicine is diverted for the time being into industry. But such partial application can only be an earnest beginning of what can yet be accomplished over the whole field of humanity, and of its potential contribution to universal happiness, so sadly lacking in the past few years.

Parietal Neuralgia

R. H. McDonald, M.D. In CLEVELAND CLINIC QUARTERLY, 12:1:31, January 1945.

Parietal neuralgia is induced in the great majority of cases by some pathologic process or by pressure upon the spinal nerve root, usually at the point where it emerges from the intervertebral foramen. The commonest cause in older patients is undoubtedly a hypertrophic arthritic process of gradual encroachment upon the foramen. In younger patients the question of postural strains must be considered. Structural scolioses, injuries and tumors of the bone may be readily recognized, but functional scoliosis may escape notice. This will only be seen by careful examination of the patient's back and posture. Any complete physical examination must include careful observation of the patient's back, preferably with the patient standing in his bare feet.

Treatment of parietal neuralgia depends upon the process which has caused it. In the arthritic patient the use of heat and massage over the affected area will be of value. Limitation of the movement of the spine by adequate braces may be useful, and x-ray therapy to the spine has apparently been beneficial. Avoidance of prolonged walking and standing and a period of recumbency in a firm bed may be useful from a therapeutic viewpoint and also as an aid in diagnosis. In the case of younger persons, especially those of asthenic type, the use of graduated postural exercises is of chief importance. By their use muscle tone is improved, and ligamentous strain is relieved. Marked improvement of peripheral circulation is frequently seen in association with deep breathing exercises, and an improved position and circulation of the abdominal viscera often alleviates the indefinite gastrointestinal symptoms of which these patients complain. A short lower extremity may be corrected with a lift in the heel sufficient to cause the pelvis to be level and to restore the symmetry of the spine, thus overcoming the mechanical basis for strain. Adequate rest is also beneficial and may be all important in the chronically exhausted individual.

A Plan for Rehabilitation for Rheumatic Subjects

J. G. Fred Hiss, M.D., Syracuse, N. Y. In THE JOURNAL OF PEDIATRICS, 26:3:231, March 1945.

A rheumatic subject rehabilitation plan has two distinct parts, sometimes interdependent and sometimes entirely distinct.

A few of these advantages are listed:

1. Practically all of the children of the community attend public school from the age of 5 or 6 to the age of 14 to 18 years.

2. Because of the routinely repeated physical examinations it is possible to detect cardiac lesions regardless of whether they have, or have not, been preceded by symptomatic rheumatic infections. There is also the opportunity to correct erroneous diagnoses previously made.

3. Schools are ideal for providing vocational guidance to those children with physical handicaps and for providing corrective measures for those who have developed mental handicaps because of rheumatic fever.

4. The School Health Service provides an excellent way to disseminate the best scientific information available about rheumatic fever and its many problems—directly to school physicians and indirectly to other physicians in the community.

5. The schools also furnish an excellent outlet for publicizing many aspects of the disease to nurses, teachers, mothers.

Developments in Arthritis

Ralph Pemberton, M.D., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa. In THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 209:3:368, March 1945.

Effective therapy of arthritics requires a regimen of "total support" of the patient. There are obviously two therapeutic aspects to total support; one, in general, removes from the field such accessible factors as make for or constitute worry, fatigue, faulty body mechanics, faulty nutrition and focal infection; the other seeks to provide constructive factors such as rest, correction of anemia, replacement therapy in the gastro-intestinal or endocrine system; tonic medication, sedation, physical therapy, and optimal nutrition. Obviously these objectives and measures overlap.

Recognition of the operation of neuro-endocrinous influences in the syndrome as a whole, and in a regimen of total support in particular, not only contributes to a rational concept of the nature of the disease but also serves to bring into better perspective a number of valuable therapeutic practices.

Report on Immersion Foot Casualties from the Battle of Attu

Major Albert Lesser, M.C., A.U.S., New York, N. Y. In ANNALS OF SURGERY, 121:3:265, March 1945.

Two groups of patients with immersion foot have been observed and treated at McCaw General Hospital since June 1943. The first group consisted of 25 patients who were admitted to the hospital with varying degrees of sepsis and gangrene of the feet, arriving approximately three weeks after having been removed from combat duty on the island of Attu. The second group of patients, numbering 27, consisted of cases admitted here at intervals by transfer from the Northwest Pacific area, with subjective complaints of delayed or latent disturbances of the feet coming on approximately six months or more after exposure during the battle of Attu.

Throughout hospital treatment vascular exercises of the lower extremities were conducted three times a day in an organized class fashion under the direction and supervision of one of the soldiers. As soon as the local condition of the extremities and wounds permitted, patients received physical therapy in the form of whirlpool, massage or muscle stimulation as the individual case required.

All of the original group of 25 patients were walking well, without need for crutches, cane or any other type of support at the time of discharge from the hospital. Those patients who suffered loss of distal portions of the feet involving all or any part of the metatarsals were able to walk surprisingly well when, in addition to fitted arch supports, a spring steel longitudinal strip was incorporated in the sole of the shoe. In some cases a transverse leather bar was added to the sole of the shoe, back of the metatarsal heads, in place of the transverse arch support usually placed inside the shoe. This modification seemed to supply a fairly satisfactory substitute for the "spring" of the metatarsophalangeal joints which is probably necessary in the take-off of each step. In those feet in which tarsometatarsal disarticulation was performed, there was no evidence of distorted tendon pull and there was normal stable body weight-bearing on the remnant of the foot.

A Study of Hallux Valgus: Its Cause and Operative Management

Robert T. McElvenny, M.D. In QUARTERLY BULLETIN OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 19:1:26, Spring Quarter, 1945.

The principles of the Silver Procedure consists of the following:

(1) The plastic procedure on the joint capsule to restore normal tension between the two sides of the joint.

(2) The removal of the medial side of the metatarsal head (Simple Exostectomy).

(3) The replacement of the sesamoids in their normal relation to the metatarsal head.

(4) The correction of forefoot splay.

By the end of the fourth week, the great toe should be in neutral position. The splint should be removed at four weeks. The anterior foot lacing is worn for ten weeks from operation. After this, all support is removed.

Three weeks after operation, these people are walking comfortably and well in their anterior lacing and splints. Four weeks after operation the splint is removed, the patient is given loose stockings and wide shoes. Physical therapy consisting of massage and soaks is instituted.

The Management and Treatment of Cranio-Cerebral Injuries

Loyal Davis, M.D. In QUARTERLY BULLETIN OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 19:1:22, Spring Quarter, 1945.

We had the opportunity of seeing at first hand the organization of the Red Army Medical Corps and the methods which they used to manage and surgically treat cranio-cerebral injuries. The essential principle upon which they based their reported excellent results was the utilization of competent neurological surgeons in hospitals, as far forward as the Evacuation Hospital is situated in the United States Army, completely equipped and staffed to perform definitive neurosurgical operations. There was no problem of fixed tables of organization and supply to surmount before electrosurgical units, suction apparatus and x-ray equipment could be placed as close to the injured man as the tide of battle would permit.

Finally, nursing care must be intensive, intelligent and enthusiastic. Sufficient help must be provided to turn the comatose patient frequently; to care properly for the skin; to see that he gets food and fluid; to prevent the extreme restlessness which is produced by a distended bladder or a wet bed; to control sedation carefully and last, to have the proper attitude toward the patient's injury so that he may be returned quickly to activity around the ward and his final rehabilitation be successfully and speedily accomplished.

Rehabilitation of the Industrial Casualty

Alexander P. Aitken, M.D., Boston. In ARCHIVES OF PHYSICAL MEDICINE, 26:1:27, January 1945.

The all important factor in the treatment of any traumatic lesion is the element of time.

It must be remembered that nature heals all injuries, regardless of the tissue involved, by scar tissue. Consequently, when an injury has involved skin, fat, muscles, tendons, nerves and bones, as in compound fractures, all the structures become healed in a mass of scar tissue. Adhesions thus are formed between all these structures and interfere with their free play. With time, scar tissue contracts and becomes more and more dense and less and less elastic. Consequently, unless such adhesions are broken or stretched by early motion, they may become so dense and tight that normal function may never be regained. The importance of early motion thus can be seen.

When any part is immobilized in apparatus, two other important changes occur. First, there is a gradual loss of joint motion. The second condition is the development of muscle atrophy.

When a patient with an acute condition is admitted to the center, he is first sent to the physical therapy department. Baking, massage and graduated exercises are given until sufficient strength and motion have returned to permit of some occupational therapy. Such treatments are carried out after the patient has started his work therapy if necessary. As the work tolerance is built up the physical therapy is cut down, while the work therapy is increased. Our physical therapy department is quite complete, and almost any form of physical therapy can be administered. Shoulder wheels, stall bars, resistance bicycles, pulleys and weights and a rowing machine are available for special exercises.

On admission to the occupational therapy department the patient is given actual work to do. The work is always done with the aim of increasing the strength and range of motion of the injured part.

Establish Committee on Prosthetic Devices

Medicine and the War, J.A.M.A., 127:14:925, April 7, 1945.

A study of the problems associated with providing war veterans with artificial limbs has been initiated, on request of the Surgeon General of the Army, by the National Academy of Sciences and the National Research Council, through a newly established Committee on Prosthetic Devices. The committee will represent jointly the Division of Engineering and Industrial Research and the Division of Medical Sciences of the council, and its activities, including the necessary research entailed in the project, are supported by the Office of Scientific Research and Development, through the latter's Committee on Medical Research.

Chairman of the committee is Dr. Paul E. Klopsteg, professor of applied science at Northwestern University and director of research of the Northwestern Technological Institute. Dr. Klopsteg states that it is the intention of the committee to consider the problems from the points of view of engineering, production, fitting and servicing as well as from their medical and surgical aspects. Its purpose is to make certain that veterans will be provided with the best possible prosthetic appliances that can be devised.

In considering mechanisms and parts of limbs the committee has no intention of disregarding all the good work that has been done but, rather, it will analyze objectively every meritorious device. Any new development will begin on the foundation of experience already available, as manifested in the many ingenious mechanisms now in use and in the success that has been achieved in the fitting and use of limbs by both military and civilian personnel. Another aim of the committee is to bring about as much standardization as possible in parts and mechanisms, to assure simplification of maintenance and repair.

In view of the magnitude of the task, the work being undertaken by the committee is expected to continue for many months; but it is likely that results and findings that may be immediately applicable will be released as soon as they are available. To assure the utmost utility and practicality of any developments done under the auspices of the committee, close working relationships are being established with government amputation centers in the hospitals of the armed forces.

The operating headquarters of the committee are at Northwestern University, Evanston, Ill.

Postpartum Massage of Deep Pelvic Muscles

Walter S. L. McMann, Captain, M. C., A. U. S. Correspondence, J.A.M.A., 127:14:945, April 7, 1945.

To the Editor:—Dr. E. H. Terrell, whom I remember with pleasant memories from internship days, in THE JOURNAL, Oct. 28, 1944, calls attention to the work of Dr. George Thiele, whose "contribution . . . is the most valuable given in our field (proctology) during the past decade." Also in the field of obstetrics it has been a most valuable contribution. I have found it to be of great benefit in the late postpartum care of the obstetric patient.

So often, after delivery, there are vague sacro-iliac and sacrococcygeal pains. Palpation of the deep pelvic muscles will reveal them to be spastic and painful. The trauma incident to delivery is the most likely explanation. Massage of these muscles by rectum with the patient in the lithotomy position usually gives gratifying relief. Particularly so is this if there has been undue displacement of the coccyx.

As Thiele emphasizes, massage at first should be light and of short duration, progressively increasing the pressure and length of time of treatment as the spasticity of the muscles relaxes.

Similar pain in the nonpuerperal woman has also sometimes yielded to this therapy.

Air Fresheners

Editorial, J.A.M.A., 127:15:990, April 14, 1945

The American Medical Association's Committee to Study Air Conditioning in a recent preliminary report to the Board of Trustees, not yet published, makes this statement: "Air provided by air conditioning systems may be deodorized, properly humidified or dehumidified, moved at rates suitable for human comfort and altogether may promote human comfort, but there still remains an artificial quality. Early future developments may bring the air of the country hilltop into the cocktail lounge, but, as labeled by the committee charged with the responsibility of watching such development, such air not yet has arrived."

The Clinical Management of Weakness and Fatigue

Frank N. Allan, M.D., Boston. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 127:15:957, April 14, 1945.

Diagnosis

In a study recently reported elsewhere an analysis was made of the findings in 300 cases in which examination was requested because of a complaint of weakness, fatigue or weak spells. Physical disorders were found to explain the complaint in 20 per cent; nervous conditions were held responsible in 80 per cent.

Physical disorders of twenty-four types were encountered. The most common conditions were chronic infections, diabetes, heart disease, severe anemia, nephritis and various neurologic disorders including narcolepsy and myasthenia gravis.

Of the 239 patients whose weakness and fatigue were attributed to a nervous condition, the patient was considered neurotic in less than 1 out of 5. A small number (6 in all) had simple mental depression. The majority were suffering from what may be termed "benign nervousness." This was classified as chronic nervous exhaustion when severe and prolonged and as nervous fatigue when mild. Although no sharp line divides the three groups, it is important, as will be pointed out later, to make a distinction in order to plan the most effective treatment and evaluate the prognosis.

Summary

For many of the physical disorders, treatment which is more or less specific is available. For a nervous patient, removal of a cause of worry is also a specific remedy. As with the physical disorders, the nervous conditions require proper classification to guide treatment and indicate prognosis. A psychoneurosis was present in less than 1 in 5. A small number had a simple mental depression. The majority had a benign nervous condition classified as chronic nervous exhaustion when extreme and prolonged, and as nervous fatigue when of lesser degree. With each type a different therapeutic approach must be employed.

Psychotherapy and nonspecific measures must be adapted to suit the needs of the individual case. Special psychiatric care is desirable in dealing with many of the cases of psychoneurosis, some of the cases of mental depression and a few of the cases of chronic nervous exhaustion. Most of the benign nervous conditions do not properly fall within the field of psychiatry. They represent a challenge to all of us engaged in the practice of medicine.

Application of High Frequency Phenomena in Medicine

Harold J. Holmquest. Quart. Bull., Northwestern University Medical School, 19:41, Spring 1945.

It is important to consider the technic to be employed in the treatment of various conditions and to adapt the technic as regards the method of application, the intensity and duration of treatment and the frequency with which treatments are to be administered, so that much untoward effects will be obviated. In order that one may intelligently administer high frequency energy, individualizing each treatment technic to the pathologic condition present, a knowledge of the fundamental physical laws governing the generation of high frequency currents and the various circuits, and particularly through electrolytes, is necessary.

There are two methods in practice of applying high frequency power to tissue for treatment purposes: One, by means of the high frequency field such as exists between plate electrodes, with or without an air space between electrodes and the skin, and the other, by means of the high frequency magnetic field, which is set up by the high frequency current flowing through a coil which is wound around the part to be treated or wound into a flat "pan-cake" type coil and placed over the tissues in which it is desired to generate heat.

Careful investigators here and abroad seem agreed today that the only demonstrable effects of short wave diathermy are the production of heat and the physiologic effects that normally follow the production of heat in tissue.

That method of applying short wave diathermy which develops heat primarily where oxidation produces it naturally in the human body, thereby inducing and maintaining an active hyperemia and permitting the warmed circulation blood to convey heat to other tissues, would seem to be preferred method of application for treatment of all conditions that might be benefitted by such therapy. Experiments have been performed showing that the induction field generates heat in an electrolyte in proportion to the conductivity of the electrolyte. Such a field should produce heat dominantly in vascular tissue. Actual measurement of temperatures obtained in the deep tissues of living subjects have confirmed this theoretical deduction.

In order that the operation of short wave diathermy machines do not interfere with other services whose satisfactory operation depends on the unhindered transmission and reception of electromagnetic radiation, frequencies for medical use should be allocated. The shielding of such equipment is impractical. The frequency bands allocated should be in the region of 10 to 15 megacycles for induction heating and 40 to 50 megacycles for electric field heating. In the opinion of the author if but one band is allocated for medical use, that band should be for induction heating, since that method of application is, according to available evidence, the preferred method.

The Problem of the American Spas

Richard Kovacs, M.D. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 127:15:977, April 14, 1945.

The usefulness of a spa regimen is well established in acute and chronic gastric disease, in catarrhal diseases of the gallbladder and milder forms of colonic irritation, in various forms of kidney and gallbladder disease, in catarrhal disorders of the respiratory tract, in many forms of heart disease, in most forms of chronic arthritis and in rheumatic disorders of muscle, nerves and tendons, and in some metabolic and skin disorders. Spa therapy also has been proved of immeasurable value to people exhausted after acute illness or operation. Hence the increasing employment of spa treatment in recent years for convalescent care.

Comment

The solution of the problem of the spas is a difficult one because of the many conflicting medical, social, economic and political issues. Improving the medical situation is perhaps the most clearcut issue but in meeting it the advancement of balneology and the creation of a simple supervising agency is not sufficient. If spas are not to be left drifting along with the ultimate survival of the fittest there must be a general advisory and driving force organized either by the spas themselves or by a friendly outside agency. Only by a well guided cooperation of the medical profession, the public and the authorities concerned can a gradual, nationwide raising of the general status of American spas be achieved and their desirable role as part of a national health system be fully developed.

Facilities for the Chronically Ill

Pearl L. Morrison, Reg. N., Superintendent, Queen Elizabeth Hospital, Toronto. In THE CANADIAN HOSPITAL, 22:1:34, January 1945.

Attention is drawn to the fact that there are many people—physically incapable of caring for themselves—taking up room in acute hospitals who are not ill—and this fact gives us much food for thought in our postwar planning. Many people seem inclined to class all who are unsuitable for acute hospitals as "chronics" or "incurables." The needs of three distinct groups might be considered (not counting the so-called convalescent):

1. Those who merely need assistance in cleanliness, dressing and feeding;
2. Those who are senile, incontinent and mildly mentally-disturbed;
3. Those suffering from chronic illness and needing skilled nursing and medical care with every remedial measure possible.

The physical therapy department is a growing need of the hospital caring for chronic patients. The new underwater treatment for arthritis, the paraffin bath, artificial sun rays and so on, all have proven of great help.

Studies on Muscle Innervation in Poliomyelitis and Nerve Injuries

Arthur L. Watkins, M.D., and Mary A. B. Brazier, Ph.D. Boston. In ARCHIVES OF PHYSICAL MEDICINE, 26:2:75, February 1945.

Summary

Quantitative studies of muscle innervation in poliomyelitis and nerve injuries are of value in physical medicine.

1. Measurements of motor power and fatigue are objectively recorded by an ergograph.
2. Voltage-capacity curves of electrical excitability give quantitative information as to neuronal damage in poliomyelitis. In peripheral nerve injuries this method aids in the detection of regeneration.
3. Electromyograms of action potentials are an additional index of muscle function.
4. Spontaneous electrical discharges from muscles at rest are sensitive indicators of reinnervation.

In poliomyelitis the application of these methods reveals a recovery process in the motor unit. Accurate evaluation of nerve injuries is facilitated by these technics.

Experimental Studies on the Electrical Reactions of Denervated Skeletal Muscles

Major O. L. Huddleston, M.C., U.S.A. In ARCHIVES OF PHYSICAL MEDICINE, 25:4:197, April 1945.

Experiments were performed on adult dogs of various ages and sizes. Crushing of the anterior roots through which the impulses to the muscles of the hind leg pass was performed with a small hemostatic forceps. This resulted in motor denervation of the right hind leg, without disturbance of the sensory innervation. In one group of four animals the right hind leg muscles were immobilized with a modified Thomas splint while a control group of six animals was not immobilized.

Electrical thresholds were determined for constant current and faradic stimulation at the end of the recovery period. Chronaxie and time intensity curves were taken in a group of four animals. The author considers his chronaxie measurements not sufficiently reliable to be of value. There was a slightly greater increase in threshold for faradic stimulation in the immobilized legs than in the normal leg. The one exception was the motor point of the anterior tibial muscle where the reverse occurred. With constant current stimulation there was a considerably greater increase in threshold in the immobilized muscle than in those which were not immobilized. The author concludes that immobilization is of no value in hastening or facilitating the return of irritability of neuromuscular tissues after denervation; on the contrary it appears to retard the return of normal excitability.

Modified Treatment for Fracture of the Head of the Radius

Captain R. W. Postlethwait, M.C., A.U.S. In THE AMERICAN JOURNAL OF SURGERY, 67:1:80, January 1945.

Fractures of the head of the radius which do not show marked displacement will recover more promptly and completely if treated by joint aspiration, procaine injection into the joint and immediate active motion. The aspiration of the hemarthrosis and the injection of procaine will produce relief of the severe pain which occurs soon after injury and will permit earlier increase in the range of motion.

The Scalenus Anticus Syndrome With and Without Cervical Rib

J. G. Love, M.D., M.S. in Surgery, Section on Neurosurgery. In PROCEEDINGS OF THE STAFF MEETINGS OF THE MAYO CLINIC, 20:5:69, March 7, 1945.

Cervical ribs are of infrequent occurrence.

Treatment—All patients who have cervical ribs do not require treatment. In fact, many persons have cervical ribs and never know it. Others learn the fact for the first time when a roentgenogram of the thorax or neck is made for some entirely unrelated reason. Patients with mild symptoms often are benefited by conservative measures, such as lessening the load on the involved shoulder girdle, application of heat locally and sleeping with hands above the head or prone with the arms over the sides of a narrow bed. Others require analgesic drugs such as acetylsalicylic acid.

When it has been determined that more radical measures are necessary for relief, scalenotomy with or without removal of the rib is indicated. The anterior approach is the operation of choice even if the rib is to be resected.

Book Reviews

Handbook of Physical Medicine. *By Council on Physical Medicine of the American Medical Association. Cloth. Price, $2. Pp. 392. Chicago: American Medical Association, 1945.*

This really is the fourth edition of the "Handbook of Physical Therapy," but the name has been changed so it is the first edition of the "Handbook of Physical Medicine." This edition is necessary in order to keep pace with new developments in physical medicine.

This handbook is the outgrowth of twenty years of work by the Council on Physical Medicine. "Physical medicine," in the opinion of the Council, is a term employed to define the diagnosis and treatment of disease by various nonmedical means.

Several new articles have been added, such as "Heat in Surgical and Orthopedic Conditions" by Dr. Frank R. Ober; "Body Mechanics and Posture" by Dr. K. G. Hansson, "Therapeutic and Remedial Exercise" by Dr. Frank H. Ewerhardt; "Occupational Therapy in a Private General Hospital" by Dr. John S. Coulter; "Direct Current Applications and Electrical Stimulation of Muscle" by Dr. S. L. Osborne; "Physical Characteristics of Electrical Energy" by Howard A. Carter; "Physical Therapy in Infantile Paralysis" by Dr. Frank R. Ober, and "Physical Therapy in Psychiatric Practice" by Dr. Winifred Overholser. The other articles of interest to the general practitioner have been revised. Some articles not of interest to the general parctitioner have been omitted.

This handbook admirably serves an important aim of the Council on Physical Medicine in that it gives reliable information to aid the practicing physician in choosing true and sound physical therapy methods. It should be in the hands of every medical student and is highly recommended to every physician. Physical therapists also will find this an authentic reference book.

Constitution and Disease, Applied Constitutional Pathology. *By Julius Bauer, M.D., Professor of Clinical Medicine, College of Medical Evangelists, Los Angeles; Senior Attending Physician, Los Angeles County General Hospital; Consultant in Medicine, Cedars of Lebanon Hospital, Los Angeles. Second Edition. Cloth. Price, $4. Pp. 247. New York: Grune and Stratton, 1945.*

Diseases are classified and labeled from the point of view of a uniform etiology or pathology. It is common knowledge that no two individuals are ever completely alike. The author believes that the main cause of individual variability lies in sexual mating. The discovery made in 1865 by the Austrian monk, Gregor Mendel, has become the foundation of the science of genetics which has given us an understanding of the principles underlying individual variability.

Bauer states: "Although we are not able to change genes and to improve deficiencies in the chromosomes, we may alter the environmental conditions that are indispensable or particularly favorable for the actual manifestations of such deficiencies." The author believes that physical therapy is at our disposal for improving the efficiency of the muscular apparatus, the circulation, the kidneys, the glandular functions and the nervous system.

This little book will stimulate medical thinking. It will cause us to remember that the laboratory is a good servant but a bad master. It shows that more attention should be paid to the constitutional or genetic standpoint in both general and specialized practice of medicine.

Diseases of the Nervous System in Infancy, Childhood and Adolescence. *By Frank R. Ford, M.D., Associate Professor of Neurology, The Johns Hopkins University. Second Edition. Cloth. Price, $12.50. Pp. 1141, with 164 illustrations. Springfield, Illinois: Charles C Thomas, 1944.*

The neurology of childhood is still in an early stage of development as contrasted with that of adult life, and even the common neurological disorders of this period are, to a large extent, obscure. This book brings together and analyzes the available information about these conditions.

The author has developed a classification based primarily upon etiology with due emphasis upon clinical features, rather than a purely anatomical classification. Essential clinical features of each condition are given with a brief discussion of pathological anatomy, diagnosis, prognosis and established principles of treatment. The neurological complications of diseases not primarily neurological are also given a brief discussion of the general aspects of the disease. The consensus of opinion of the leading authorities and the author's own opinion are given.

This book is a valuable book for reference for physical therapists. The contents of one chapter of the thirteen will show its value in this regard. Chapter XII discusses diseases of the muscles and considers the following: congenital defects of the muscles; congenital absence of muscles, and congenital contractures of muscles; heredofamilial diseases of muscles: muscular dystrophies, myotonic dystrophy, and myotonia congenita; traumatic conditions of muscles: Volkmann's ischemic contracture and other conditions; inflammatory diseases of muscles: dermatomyositis, myositis fibrosa and epidemic myalgia; toxic and metabolic disorders of muscles: myasthenia gravis; periodic family paralysis, progressive myositis ossificans.

Each chapter represents the considered experience in its particular field and may be taken as an authoritative statement of the latest practice. This book covers a wide scope and fills a long-felt need. Every physician treating diseases of infancy, childhood and adolescence can profit by perusal of this volume.

Laboratory Manual for Elementary Physiology. *By Lalia V. Walling, Assistant Professor, and Kenneth Siler, formerly Instructor, University of Kansas. Fourth Edition. Paper cover with loose-leaf plastic binding. Price, $1.50. Pp. 187. St. Louis, Missouri: The C. V. Mosby Company, 1945.*

This book, as the title states, is strictly a laboratory manual and would be of little use to the student without the aid of a textbook. The work is presented under thirteen headings. Under each subdivision there are a number of appropriate exercises outlined with numerous questions for the student to answer and space allotted for drawings or kymographic tracings as indicated. As the authors state these laboratory exercises are planned to demonstrate the simpler, fundamental reactions of the living organism and the protoplasm of which the organism is composed. In no sense of the term are they exhaustive. The following subject matter is studied: the cell, tissues, physiology of muscle and nerve, physiology of the central nervous system, the receptors or sense organs, physiology of blood, circulation, respiration, chemical tests for foods, physiology of digestion, metabolism, heat regulation, and excretion. The manual should prove an invaluable aid to instructors of college courses in elementary physiology. The material is well selected and progressively outlined. The authors have made an excellent contribution.

Practical Methods in Biochemistry. *By Frederick C. Koch, Frank P. Hixon Distinguished Service Professor Emeritus of Biochemistry, University of Chicago; Director of Biochemical Research, Armour and Company, Chicago, and Martin E. Hanke, Associate Professor of Biochemistry, University of Chicago. Fourth Edition. Cloth. Price, $2.25. Pp. 353, with 20 illustrations. Baltimore: William Wood & Company, 1943.*

This laboratory manual, the authors state, is intended for medical students and presents the more important qualitative and quantitative chemical aspects of cell constituents, of cell activities and of the composition of the blood, secretions and excretions. The book is intended for use as a practical companion to a textbook of biochemistry. The book is divided into three parts. Part one: the chemistry of cell constituents is studied. Part two: studies are made of the chemistry of the digestive tract; and part three: studies are made of blood and urine. In part one, 103 experiments are well outlined for the student to perform in the testing for carbohydrates, lipins, proteins, amino acids, nucleoproteins, nucleic acids and hydrogen ion activity. The chapter on hydrogen ion activity is outstanding in its simplicity of presentation; in fact, this is one of the notable features of the book. Students who have struggled with the Henderson-Hasselbalch equation will appreciate this section for the authors, by example, make it very clear and understandable. Its simplicity however does not detract in the least from the completeness of its presentation. There are 37 experiments to be performed on salivary digestion, gastric digestion, intestinal digestion and bile. Part four deals with tests for the quantitative analysis of blood and urine. One chapter discusses the chemical examination of urine for pathological conditions. Of special interest in this section is the series of colorimetric tests for vitamins and chemical tests for hormones. An excellent appendix on general laboratory instructions is not the least useful part of this authoritative and practical book. All students or those interested in biochemistry will find this small volume a worthy addition to their library.

Anatomy and Physiology for Students of Physiotherapy and Occupational Therapy and Gymnastics. *By C. F. V. Smout, M.D., M.R.C.S., L.R.C.P., Senior Lecturer and Assistant Professor, Department of Anatomy, University of Birmingham, Examiner to the Chartered Society of Physiotherapy, and R. J. S. McDowall, M.D., D.Sc., Professor of Physiology, University of London, King's College. Cloth. Price, $8. Pp. 418, with 285 illustrations. Baltimore: The Williams and Wilkins Company, 1944.*

In the United States the hours devoted to anatomy in the course for students of physical therapy are of such number as to require a much larger book than this. In fact, many of the courses require anatomical dissection. The authors state: "It is not intended that this book should be used as a substitute for the larger textbooks in Anatomy and Physiology, and it is hoped that these will be freely consulted." Most schools in America use the larger textbooks in anatomy and physiology as texts in the course of physical therapy.

This book has been planned, according to the authors, "in strict accordance with the Syllabus of the Chartered Society of Massage and Medical Gymnastics." As our requirements differ in this country it cannot be recommended to physical therapists as a textbook. The anatomy and physiology requirements for the occupational therapists are not as rigid as for physical therapists, so this might serve them as a textbook in these subjects.

Synopsis of Neuropsychiatry. *By Lowell S. Selling, Sc.M., M.D., Ph.D., Director, Psychopathic Clinic, Recorder's Court, Detroit, Michigan. Fabrikoid. Price, $5. Pp. 500. St. Louis: The C. V. Mosby Company, 1944.*

The author has written this book to supply what he recognizes as a shortcoming in the field of neuropsychiatric literature, that is, a brief systematic outline so the student would not be "overwhelmed by the detail of conventional medical textbooks." He believes such an aid is valuable to the practicing physician and even to the specialist for "his routine annual review of his subject." The objectives in mind were meritorious but unfortunately the product does not come close to achieving its purpose.

The synopsis has the usual inadequacies of such books. Subjects are discussed so briefly as to give a very inaccurate picture of any but a few entities. Many important considerations are omitted. Of necessity differential diagnosis must be treated lightly if at all.

However, this synopsis has even more flagrant defects. The subject matter of neurology is divided into sections on the spinal cord, brain stem, cranial nerves and so on. In each section are discussed the anatomy, physiology and then clinical entities. Much of the physiology is garbled and incomprehensible to this reviewer. The whole section of neurology is full of inaccuracies and it would take a lengthy review to point them all out. For example, on page 28 one of the signs of a radial palsy is given as the inability to flex the forearm because of paralysis of the supinator longus. The author apparently has forgotten about the other flexors of the forearm. The discussion of peripheral nerve lesions is so poor as only to confuse anyone in making a diagnosis. On page 117 he states that the glossopharyngeal is the taste nerve of the tongue and on page 141 he corrects himself to point out taste for the anterior two-thirds of the tongue is carried with the facial nerve. There are many errors in the use of words which appear to be failures to correct the proofs.

The section on psychiatry is a little better but still confusing. It does not follow accepted standards of presentation and hence is only a brief presentation of the author's own point of view. He presents Freud's classification of the neuroses in outline form and it seems to be far too complex for any student.

The general tone of the book is that it has been hastily constructed and inadequately thought out. There is some merit in the nature of the book that the author has attempted but he has tried to make it so inclusive that, at least to this reviewer, it is not a success.

Practical Occupational Therapy for the Mentally and Nervously Ill. *By Louis J. Haas, F.A.A., O.T.R., Director, Men's Therapeutic Occupations, The New York Hospital, Westchester Division, White Plains, N. Y. Cloth. Price, $6. Pp. 432, with 356 illustrations. Milwaukee: Bruce Publishing Co., 1944.*

This book is divided into three parts: first, a discussion of the history of occupational therapy; the mission and aims of this therapy, and receiving the new patient and administering the prescription. Individualizing the treatment and the importance of crafts applied to occupational therapy is emphasized. Case histories are given to show the importance of the principles discussed. Part two discusses departmental organization, records, the relation of this department to general hospital service and its equipment.

Over half of the book is occupied by part three which gives excellent instruction in and practical information on crafts. The crafts given are within reach of all, even when space and funds are limited. The author says that elaborate workshops and complicated equipment are not necessary for the benefits of occupational therapy to those who need it, but that in many instances simple tools and easily obtained equipment, including waste material, may help bring about the desired result.

The author is highly qualified to write on this subject as he has had extensive training at the Maryland Institute of Art and Design and the Rhode Island School of Design, and he has had many years of practical experience at the hospital where he is now located. Although the experiences recorded in this book were gained in the field of the mentally and nervously ill, they are valuable in other fields of occupational therapy.

Physical therapists should know some occupational therapy and this book can be recommended to them as a reference work. It is highly recommended as a text for occupational therapists.

Anatomy as a Basis for Medical and Dental Practice. *By Donald Mainland, M.B., Ch.B., D.Sc., F.R.S.E., F.R.S.C., Professor of Anatomy, Dalhousie University, Halifax, N.S., Canada. Cloth. Price, $7.50. Pp. 863. New York: Paul B. Hoeber, Inc., 1945.*

This is one of the Medical Student Series of which Fred C. Zapffe, Secretary of the Association of American Medical Colleges, is the editor. The author in his first chapter on "How to Use This Book" says: "This book could not justifiably be entitled 'Anatomy Made Easy.' On the contrary, anyone who uses it must work hard and think hard, not only because it is condensed, but because it contains ideas and problems as well as facts."

This book is a modern and different approach to the study of anatomy. In the past, anatomy textbooks were loaded with memory exercises and multitudinous facts which are beneficially omitted from this book. The clinical facts are never sacrificed but the text is stripped of nonessentials; however, it still includes all those facts of importance in actual practice.

The first of the three main sections deals with aims and methods of study, formulating rules and suggestions for observation and exploration. The second section on general anatomy discusses normal variation, development, and the structural and functional principles of organs. The main portion of the books, on regional anatomy, is so presented that the student refers continuously to living people. Clinical topics, such as the anatomico-physiological aspects of hernia and appendicitis, are given in detail. Individual organs are not demonstrated as isolated parts — instead a region is built up from the vertebral column to the body surface.

Appendices contain normal weight tables, pelvic dimensions, dates of ossification, and tooth eruption. One appendix offers suggestions for study, review, consultation of literature and preparation of articles.

This book does not cover the work necessary for all courses and examinations but it contains information, ideas and methods that have a lasting value and to them the student can easily add such extra information as the teacher gives him. Some of the information contained in this book is not in other textbooks, but is used by clinicians and therefore should be known by students.

This book can accompany any good anatomical atlas and is not tied to any particular dissection routine. This book can be used by physical therapists as a reference book. It can be recommended as a textbook for medical and dental students. Graduates and general practitioners should find much of interest and value in this material.

Methods of Treatment. *By Logan Clendening, M.D., Clinical Professor of Medicine, Medical Department, University of Kansas; Attending Physician, University of Kansas Hospitals, and Edward H. Hashinger, A.B., M.D., Clinical Professor of Medicine, Medical Department, University of Kansas; Attending Physician, University of Kansas Hospitals; Attending Physician, St. Luke's Hospital, Kansas City, Mo.; with chapters on special subjects by 12 contributors. Eighth Revised Edition. Cloth. Price, $10. Pp. 1033, with illustrations. St. Louis: C. V. Mosby Company, 1945.*

This book brings together within one volume all therapeutic procedures. Each method of procedure is described clearly and minutely with particular regard to factual detail. In the textbooks of medicine usually a method of treatment is recommended without any instructions as to technic or any discussion of the rationale behind it. This volume corrects this.

The first part describes each procedure under the heading of drugs, diet, rest, anesthesia, immunologic products, extracts of the ductless glands, infant feeding, physical therapy, radiotherapy, climate, and psychotherapy. The second part considers the application, the results to be expected, et cetera, under the heading of the various diseases.

This edition is thoroughly revised. The new subjects added include the treatment of intractable pain with cobra venom, bee venom, etc.; sciatica due to herniation of the nucleus pulposus; indications for surgery in hypertension; pneumococci and influenzal meningitis; vitamin K therapy in prothrombin deficiency; the new conceptions of fat metabolism and acidosis in diabetes; the use of the newer glycosides of digitalis and of the newer insulins. Thiouracil for thyrotoxicosis and the Rh factor are given mention. Accounts of the new sulfa drugs and penicillin and the new vitamins are given. The paragraphs on the treatment of Addison's disease and the use of cortin, as well as the section on amebiasis, have been rewritten.

This book should be of interest to all busy general practitioners as it outlines all the methods of treatment in internal medicine in a single volume.

Patients Have Families. *By Henry B. Richardson, M.D., F.A.C.P., Associate Professor of Clinical Medicine, Cornell University Medical College; Attending Physician, New York Hospital; Visiting Physician, Bellevue Hospital. Cloth. Price, $3. Pp. 408. New York: The Commonwealth Fund, 1945.*

This monograph is based in large part on the "family study" conducted cooperatively by the faculties of public health, medicine and psychiatry of Cornell University Medical College, the New York Hospital and its Social Service Department, and the family service and department of educational nursing of the Community Service Society. The comprehensive project, which was financed by the Josiah Macy, Jr. Foundation sought a better understanding of the family as a unit in medical care and the implications for treatment.

Doctor Richardson presents a thoughtful consideration of this subject, drawing upon the findings and conclusions of this study, of which he was the director, as well as upon his own extensive experience as a physician. He tells in nontechnical language of characteristic family patterns that appear in connection with different illnesses and indicates their significance to the physician in diagnosis and treatment.

The family practitioner is no longer one person but a number of different persons or a number of different organizations. To appreciate the extent to which the physician has been divided up, we have to go back to the time when he was in an undissociated state. Thomas Percival, 1740-1804, was the author of a textbook which is still the standard source for all new formulations of medical ethics. This book is an excellent record of the lack of specialization even in "large and opulent towns."

There also was a highly interesting division of medical work between physicians and apothecaries. The latter had patients like the physician, and were the first to visit the sick. They acted as physicians for the poor and the rural districts. They were supposed to call in the physician when their skill was ineffective. They stood somewhere between the physician and the bedside nurse, and foreshadowed the public health nurse of today.

The author believes that the question of adequate medical care is "hotly debated, with a maximum of heat and a minimum of light." He also believes that the family practitioner still exists but more as an ideal than an actuality. He asks: "How are we going to put him together again? Will he be an individual, a hospital, a 'medical center,' a group of doctors, a voluntary plan for medical care, a governmental insurance plan, a community health center or what combination of these?"

This monograph is of interest to all who are concerned with family and social welfare.

Essentials of Pharmacology and Materia Medica for Nurses. *By Albert J. Gilbert, M.D., Instructor of Pharmacology, Aultman School of Nursing, Canton, Ohio, and Selma Moody, R.N., Instructor in Nursing Arts, The Presbyterian Hospital, Chicago. Second Edition. Cloth. Price, $2.50. Pp. 290, with 20 illustrations. St. Louis: The C. V. Mosby Company, 1944.*

This small volume presents in lucid, concise form the facts and theories of pharmacology and materia medica for nurses. It is adapted to the limited time available for this course in most nursing schools. The plan of this book follows in general the outline entitled "Curriculum Guide for Schools of Nursing" prepared by the National League of Nursing Education.

This second edition adds discussion on the important new drugs: penicillin, sulfadiazine, sulphaguanidine, succinylsulfathiazole, diethylstibestrol, evipal sodium, adrenal cortex extract, aluminum hydroxide gel and crystalline zinc insulin. Minor revisions have been made to conform with the latest editions of the "United States Pharmacopoeia," "National Formulary" and "New and Nonofficial Remedies."

It is recommended as a valuable textbook for schools of nursing.

Medical Uses of Soap: A Symposium. *Edited by Morris Fishbein, M.D., Editor of the Journal of the American Medical Association and Hygeia. Cloth. Price, $3. Pp. 182, with 41 illustrations. Philadelphia: J. B. Lippincott Company, 1945.*

This is one of the series of Lippincott's Selected Professional Books. This collection of articles forms a symposium on the medical uses of soap. The editor and nine collaborators are outstanding authorities in medicine and science. Each of the authors has previously contributed to the medical writings in this field. Occasional duplications bring out individual points of view relating to some debatable questions, such as the effects of free alkali, the comparative values of soap and soapless detergents and similar subjects.

This symposium can be recommended as answering many of the questions as to the effects of soap on the normal skin and hair, on the abnormal skin, the effects of soaps used in shaving and shampooing, and irritation produced by soap under various conditions.

Medieval Panorama: The English Scene from Conquest to Reformation. *By G. G. Coulton. Cloth. Price, $4.50. Pp. 801, with illustrations. New York: The Macmillan Company, 1944.*

Carlyle complained years ago that historians seldom tell us how our forefathers actually lived and thought. It is a fact that today the public thirsts more than ever for history that shall be picturesque, yet reasonably accurate. Here is a book designed for everybody that gives a comprehensive picture of the people of all classes in England as they lived and thought from 1066 to 1536. It is difficult to find one's way through the medieval jungle but this volume makes it interesting as the period is divided into subjects—such as science, medicine, literary life, women's life—rather than into dated periods.

The Middle Ages can be rightly understood only as a period of convalescence—slow at best, and with continual relapses—from the worst catastrophe recorded in the whole history of the Western World, the break-up of the Roman Empire. The author gives many interesting facts especially in his chapter on medicine. He points out that medicine is the field in which medieval science can best be studied; for here we have something in which all men are interested, great and small. It is shown that monastic medicine had no thought save for the immediate relief of the patient. All theoretical knowledge was permitted to lapse. Anatomy and physiology perished. The author says: "The belief that monks and friars were the doctors of the Middle Ages is a gigantic delusion." If chroniclers celebrated a monk's skill it is usually shown that this was exceptional and that this particular physician, like Abbot Faricius, had mastered his profession outside, in his "worldly" days.

The vivid manner in which the author tells about the people of this period may be seen in part of his description of a prioress in his chapter on cloister life. "A wimple so pleated as to earn Chaucer's commendation was technically as irregular as a guardsman's moustache would be on the quarter-deck of a man-of-war. Those who miss this fact are almost as far from the full comprehension of this particular verse as the old lady who is said to have loved Gibbon's 'Decline and Fall' for the inexhaustible mine of pious reflections which she always found in his footnotes."

There are two chapters on "The Ghetto" which remind us that in our time we have repeated history. "The Jews were in those days, as now, patient observers, and unwearied in pursuit of their own lines of thought. . . . The Bishop of Paris might seek out and burn their sacred books; but he could not destroy their influence in his own university. As practicing physicians, they were then as now in the front rank. And, finally, they represented, and knew themselves to represent, an older civilization than that of their rivals." Churchmen of the ninth century complained of their popularity and influence as physicians: "The eleventh century was marked by massacres, for which excuses were found in an asserted league between Jews and the Muslim conquerors of Jerusalem."

This panorama shows that the recent popular book "Forever Amber" did not exaggerate the customs of this period. The chapter on "Land and Folk" states: "There was one custom, repugnant to nature, which they adopted; namely to sell their female servants, when pregnant by them and after they had satisfied their lust, either to public prostitution or to foreign slavery. Drinking in parties was a universal practice, in which occupation they passed entire nights as well as days. They consumed their whole substance in mean and despicable houses; unlike the Normans and French, who in noble and splendid mansions, lived with frugality."

This should be in every library. The medieval scene brings all the charm of foreign travel. It bewitches us away from our modern and monotonous routine, revealing our own human nature in a refreshing light.

Educational Reconditioning. *War Department Technical Manual T.M. 8-290. Cardboard. Pp. 59, with 28 illustrations. Washington, D.C.: U.S. Government Printing Office, 1944.*

This is one of three manuals on reconditioning: Educational, Occupational Therapy and Physical Reconditioning. The purpose of the reconditioning program is to accelerate the return to duty of convalescent soldiers in the highest state of physical and mental efficiency consistent with their capacities or, if the soldier is disqualified for further military life, conditioned to the highest possible degree of physical fitness, well oriented in the responsibilities of citizenship, and prepared to adjust successfully to social and vocational pursuits. The mission is accomplished, according to these manuals by a coordinated program of educational and physical reconditioning and occupational therapy

Individual Gymnastics: A Handbook of Corrective and Remedial Gymnastics. *By Lillian Curtis Drew. Revised and Edited by Hazel L. Kinzly, Assistant Professor of Physical Education, Russell College, Troy, New York. Fifth Edition. Cloth. Price, $2.75. Pp. 253, with 115 illustrations. Philadelphia: Lea & Febiger, 1945.*

Among the pioneers in physical education at the turn of the century was Lillian Curtis Drew. Her work in individual and corrective gymnastics laid the basic structure for, and gave impetus to, the modern program of corrective physical education in schools, colleges and teacher training institutions throughout the country. The book, "Individual Gymnastics," was her first work, appearing in 1922.

This fifth edition, revised and edited by Miss Kinzly, fills a present urgent need. It has been brought fully up-to-date and many new illustrations have been added. Some of the highlights of this edition are the special attention to problems concerning the feet, the analysis of scoliosis, and a chapter devoted to exercises which are illustrated with line drawings.

Dr. K. G. Hansson has written the foreword and we can agree with his conclusions: "The book has been brought up-to-date in all its chapters. The new illustrations add life and zest to the text. It is just the kind of revision Miss Drew would have sponsored, because of its comprehensive text, its easy reading and well balanced content." It is recommended to physical therapists.

Burns: Discussions for Occupational and Physical Therapists. *By G. Margaret Gleave, Junior League Occupational Therapy Department, James Whitcomb Riley Hospital, Indiana University Medical Center, Indianapolis, Indiana. Paper. Pp. 19, with illustrations. Distributed by American Occupational Therapy Association, 175 Fifth Avenue, New York City, 1945.*

This pamphlet discusses the skin, classification, clinical course, prognosis and general care of burns, the nursing care, types of skin grafts, correlation of physical and occupational therapy and cosmetics. This monograph will be of interest to all physical therapists who treat burns.

Internal Medicine: Its Theory and Practice in Contributions by American Authors. *Edited by John H. Musser, B.S., M.D., F.A.C.P., Professor of Medicine in the Tulane University of Louisiana School of Medicine; Senior Visiting Physician to the Charity Hospital, New Orleans, Louisiana, with 33 contributors. Fourth Edition. Cloth. Price, $10. Pp. 1518, with illustrations. Philadelphia: Lea & Febiger, 1945.*

Nineteen of the twenty-six chapters in this standard textbook on internal medicine are prepared by heads of medical school departments, the remaining seven by authors who are heads of special divisions in departments of medicine. All of them are teachers of wide experience and authorities on the subject with which they deal.

Many changes from the third edition appear in the fourth. Some of the chapters have been almost or entirely rewritten. Four of the chapters are by new authors. The abundance of new material which has been added to this edition requires nearly 100 more pages than the previous edition in spite of the deletions made in many sections. These numerous changes and additions deal for the most part with the newer therapies: the sulfonamides, penicillin, thiouracil and many others. A certain amount of space has been devoted to the problems of war medicine, notably in conjunction with the protozoan and metazoan diseases and the acute infectious diseases. Military neuropsychiatric disabilities, war neurology and altitude sickness receive due attention.

This book can be recommended to the undergraduate medical student as an excellent textbook of internal medicine because it is written by a limited number of well qualified authors and teachers who give the essentials of the subject without allowing the work to become encyclopedic in size and impractical for study.

It is also highly recommended to the general practitioner because it gives him a book on medicine that can be used for ready reference and after each chapter there is a list of references, so that he could, did he so desire, go to source material or to outstanding contributions to medical literature for more detailed information.

Speech Reading—Jena Method: A Textbook with Lesson Plans in Full Development for Hard-of-Hearing Adults and Discussion of Adaptations for Deaf and Hard-of-Hearing Children. *By Anna M. Bunger, Instructor of Speech Reading, Department of Special Education, Michigan State Normal College, Ypsilanti, Michigan. Revised edition. Cloth. Price, $2.50. Pp. 136. Danville, Illinois: The Interstate, 1944.*

The Jena method of speech reading (lip reading) has been shown to be successful and the author of this book has contributed to its success and refinement. It should be of considerable interest to physical therapists because it treats speech as a special and complicated case of muscle coordination. The basic unit of the system is the syllable, and the muscle coordinations of speech are built around syllable formation as a motor function. The pupil is made constantly aware of the muscle coordinations responsible for speech and is asked to reproduce these. The book gives clear and detailed descriptions of actual exercises.

It is very appropriate that this book should open with an introduction by Dr. R. H. Stetson who by his studies in motor phonetics has contributed so much to our basic knowledge of muscle coordinations in speech.

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